

On the Eve of our Founder-Chancellor's Birthday 2024

"YOU GENERALLY SPEND 80% OF YOUR TIME ON 20% OF THE PROJECT."

Joseph M Juran
Architect of Quality

"All improvement happens project by project and in no other way."



Faculty of Management Studies

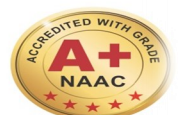


Dr. M.G.R.
EDUCATIONAL AND RESEARCH INSTITUTE
DEEMED TO BE UNIVERSITY

University with Graded Autonomy Status

(An ISO 21001 : 2018 Certified Institution)

Periyar E.V.R. High Road, Maduravoyal, Chennai-95. Tamilnadu, India.



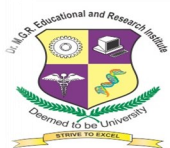
Joseph M Juran

Architect of Quality

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Faculty of Management Studies
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Faculty of Management Studies

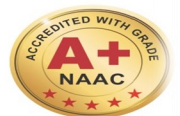


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Dedication

Taiichi Ohno



29 Feb 1912 <:::> 28 May 1990

FOREWORD

“Many quality failures arise because a customer uses the product in a manner different from that intended by the supplier.”

Dr Joseph M Juran, renowned as the Architect of Quality, established the Juran Institute with a mission: to empower organizations in crafting high-quality products and services that benefit society as a whole. Throughout his career he was driven by the desire to solve business problems and pass his experience, insights and teachings on to others.

Joseph's vision for this country was that the 21st century would be the “*Century of Quality*.” In 1994, he had argued for a national center for the study of quality. In 1997, he realized this ambition when the Carlson School of Management at the University of Minnesota established the Joseph M Juran Center for Leadership in Quality. The center focuses on rigorous research, educating scholars, and the discovery, dissemination, and teaching of quality leadership in the United States and around the world. In 2000, the American Society for Quality (ASQ) introduced the Juran Medal in Joseph's honour. The medal is awarded to individuals who “*exhibit distinguished performance in a sustained role as an organizational leader, personally practicing the key principles of quality and demonstrating breakthrough management.*”

After WWII, Juran became a professor of industrial engineering at New York University, teaching quality management. Dr Juran's work in the field of quality management drew particular interest in Japan, and in 1954 he went there to discuss his theories at the invitation of the Japanese Union of Scientists and Engineers (JUSE).

He would make a further nine visits to Japan to teach his quality management techniques, which became firmly embedded in the nation's engineering and manufacturing industries. Dr Juran remained active in the field of quality management well into his 80s consulting for top-tier organizations worldwide, including the Armed Forces, Rolls-Royce, Toyota, Motorola, Corning to name a few.

Dr Juran changed many lives. He did so through his books, videos, recordings, papers, and public addresses. He did so by simply striking up a conversation with a stranger at a conference. He changed lives by setting an extraordinary example. Through his deeds. His generosity. His wisdom. His unselfish focus on humanity. And his unrelenting goal to pay back a debt to society for the opportunities presented to him over the years. Everything he said or did represent the kind of human qualities we would all like to emulate.

This book – '*JOSEPH M JURAN – Architect of Quality*' - containing 20 chapters running into 211 pages makes an attempt to provide a glance of his life and his contributions to the field of quality. Chapter 1 provides some selected TEN architects of quality. The Juran Trilogy, Juran Technologies and Pareto Principle have been thoroughly covered with the relevant examples/illustrations.

Six selected articles on the life and works of Dr Joseph M Juran from international quality experts provide the variety and depth of his skills in quality (Chapter 20). The book is dedicated to **Taiichi Ohno**, a Japanese Quality Guru.

It is expected that the quality professionals would get much useful information, as there are several web links in each chapter.

Prof Dr D Viswanathan
Rector

Dr MGR Educational and Research Institute

PREFACE

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Born in Romania in 1904 before emigrating to Minnesota in the US in 1912, from an early age Dr Joseph M Juran displayed a keen interest in learning and developing leadership skills. In 1924 Dr Juran graduated with a degree in electrical engineering and was hired by Western Electric's Hawthorne Works (later became AT&T). It was there that he began working on his Universal Principles which began with the Pareto Principle. This early introduction to quality analysis and management would go on to shape the rest of his life. Dr Juran founded the Juran Institute in 1979. He retired at 90, but spent the following years writing his memoirs, which were published just before his 99th birthday. Dr Juran passed away in 2008 at the age of 103, but his work in the field of quality leadership continues to move forward by the Juran Team led by Joseph A. DeFeo.

In 1941, Juran came across the work of economist Vilfredo Pareto. In particular, the Pareto Principle, also known as the 80/20 rule. 'It follows the observations of Vilfredo Pareto, whose studies showed that 80% of the land in Italy was owned by 20% of the population.' Juran started applying the Pareto Principle to quality issues. He came up with the phrase: "the vital few and the trivial many" to demonstrate that a small percentage of causes can lead to a higher percentage of issues. 'In later years, Juran preferred "the vital few and the useful many" to signal that the remaining 80% of the causes should not be totally ignored.' Juran introduced the Juran Trilogy – or Quality Trilogy – in the late 1980s. This was a new way of thinking about quality, and also a way of managing quality. And is now the basis for much quality management work.

In 1979, Juran founded The Juran Institute, whose mission is to "Create a global community of practice to empower organizations and people to push beyond their limits." Juran's objective has always been to capture the universals that lay behind daily experiences. The purpose of the Juran Institute is to improve the quality of society. He said, 'Whatever you do, make sure it improves society. Don't just do it for the sake of profit'.

Dr Juran's work in Japan also helped many companies around the world develop an institutional culture of what it takes to be a quality leader. In those companies, quality work is properly valued from the lowest-level worker to the highest-level manager. A company with a cultural embrace of quality will continually strive to improve and learn from past mistakes. Industry leaders in the U.S. acknowledge that the quality renaissance during the 1980s and 1990s that contributed to enormous prosperity in the U.S. was influenced by Dr Juran's ideas. In recognition of his contributions to the U.S. competitiveness, Dr Juran was presented with the National Medal of Technology in 1992 by President George HW Bush.

One of the most influential men in the history of quality & business, Dr Joseph Juran talks to **IndustryWeek about** what it will take for U.S. industry to catch up in the global quality marathon (Chapter 17). Chapters 12, 13 & 14 contain (a) Cartoons on Pareto Principle, (b) Juran Trilogy and (c) Quality Improvement.

Chapter 10 (His Books) provides: (a) A detailed narration/discussion about "Juran's Quality Handbook, (b) selected six books with pictures of the Wrappers and brief details and (c) Web links leading to some important papers and books.

The Faculty of Management Studies expects that the book would be found very useful by the students of quality-learning and also, other stakeholders.

Prof Dr C Madhavi
Prof Dr S Ramalingam



ARCHITECTS OF QUALITY

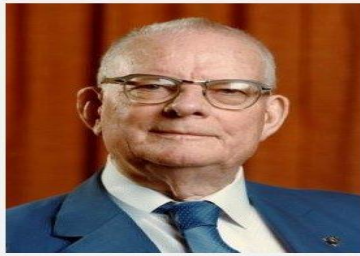
TEN GURUS

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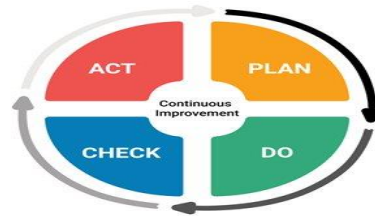
By definition, a guru is someone who is both kind and smart, and who also teaches others. In addition to these qualities, a quality guru should have a groundbreaking approach to quality in the corporate world.

Quality management is the practice of managing the whole production process to produce an excellent (quality) product or service. Quality management focuses on the customer and meeting the customer's needs, and everyone in the firm is responsible for the quality of the product. The basic quality management principles are: quality, teamwork, and proactive management. Quality management is not a single doctrine derived from a particular individual or idea—it is a collection of ideas—but there is a core group of contributors known as the Quality Gurus. These are (1) Dr. W. Edwards Deming, (2) Dr. Joseph Juran, (3) Dr Philip B Crosby, (4) Dr Shigeo Shingo, (5) Dr. Genichi Taguchi, (6) Dr. Kaoru Ishikawa, (7) Dr Armand V. Feigenbaum, (8) Dr Taiichi Ohno and (9) Walter A Shewhart. The Quality Gurus have all had a significant impact on the world through their contributions to improving not only businesses, but all organizations including state and national governments, military organizations, educational institutions, healthcare organizations, and many others.

No one can deny the crucial responsibilities played by quality experts (gurus) in expanding and transforming the idea of quality from a narrowly focused technical system to a more comprehensive body of knowledge known as overall quality with implications for management in production. TQM was first developed in Japan after WWII thanks to the work of quality experts like Deming and Juran. Eventually, influential business thinkers like Crosby, Feigenbaum, Ishikawa in and others refined this management strategy to dramatically enhance company quality. TQM gurus' proposals and theories led to the creation of several national as well as international quality awards (QAs) in the 1980s and 1990s, all with the aim of providing criteria for TQM implementation.



W. Edwards Deming



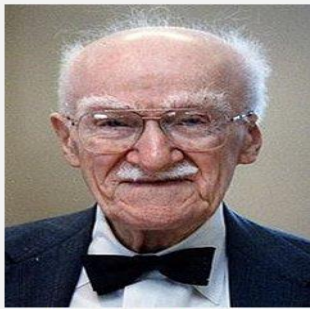
W. Edwards Deming believed that management, both at the individual and organisational levels, was responsible for 94% of quality issues. His fourteen-point plan is an all-encompassing management philosophy applicable to businesses big and small, in the public sector as well as the private and service industries.

With his "Deming Cycle," "Fourteen Points," and "Seven Deadly Diseases", Dr. W. Edwards Deming has become the most important guru of management of quality in the United States and Japan. Deming earned degrees in engineering and physics from both Yale University and the University of Wyoming. While working at Western Electric, he was inspired by Dr. Shewhart's conceptual vision for quality to create the control chart and the PDSA cycle (Shewhart cycle). After Deming left Western Electric, he applied the PDSA framework (Shewhart cycle) he had devised to "clerical activities." At the United States Department of Agriculture, he was a trailblazer in the use of statistical and sampling techniques from 1927 until early 1940. Both the War Department with the Census Bureau used Deming during World War II to adopt control charts and sample methodologies. The Japanese businesses he consulted with after the war benefited greatly from his expertise in quality assurance.

In the early 1950s, Japanese goods were notorious for their high failure rates and low quality in comparison to those of other nations. He told the Japanese that "numbers may be utilised to regulate that process", emphasising that "process" is where most manufacturing problems arise. Deming's consulting work for the Japanese economy had very favourable effects on the country's goods and services. Soon, he was hailed as a local hero. The "Deming Prize" was founded by JUSE in 1951 to recognise Deming's contributions to Japan. The "Second Order Ribbon of the Sacred Treasure" was bestowed to him by Emperor Hirohito in 1960.

The PDCA cycle, which is based on the Shewhart cycle (PDSA) that was established by Deming is a crucial framework to guide improvement for quality and productivity. DMAIC (Six Sigma) as well as DMADV (DFSS) added the rigour of a project's life-cycle (PLC) to the launch and completion of Six Sigma projects, and RADAR (the EFQM Excellence framework) has been used to evaluate business effectiveness. The "Plan-Do-Check-Act" (PDCA) technique is one way that management system standards like ISO 9001 may help businesses become more effective at meeting their customers' needs and achieving their quality goals.

Deming was vague about what constituted quality. In his "renowned system diagram," Deming argues that the consumer should be the only arbiter of quality. The consumer has a pivotal role in both the beginning and end of his system. Deming's ideas and concepts were incorporated in the creation of the ISO 9000 family of quality standards, and they even ushered in a new era in supply and chain management.



Joseph Juran



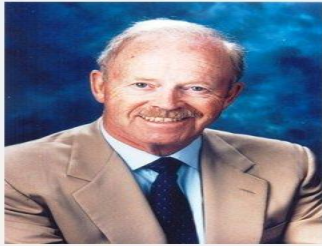
Dr. Joseph M. Juran has had more impact than any other expert in quality management, including Deming. He focused more on the management side of quality assurance. The book "Quality Control Handbook" by Juran, originally published in 1951, established him as a pioneer in the field of quality management. Beginning his career as an engineer in 1924 with Shewhart's group at the Bell System, where he was most noted for his contributions to quality improvement, Deming eventually departed Western Electric after World War II to establish his own institution. He was the second American guru to be brought to Japan in 1954 by JUSE to teach and supervise "quality control courses" to the country's top business executives, after Deming. His lectures introduced and emphasised the managerial aspects of planning, organising, and controlling, and they centred on the responsibility of leadership to achieve quality as well as the need for setting goals; this is why he emphasised a managerial approach to a similar analogy for better quality results through three basic processes or "Juran's Trilogy," which together form a successful framework for Total Quality Management to obtain quality goals and improve quality.

(i) Quality planning: a) Set targets for improved quality. b) Determine your target audience. c) Find out what your consumers want. d) Create enhancements to the product in direct response to user feedback. e) Find ways to manufacture the product's characteristics. f) Put controls in place for the process, then implement the plans. **(ii) Quality control:** a) Examine the results in the real world. b) Check actual results vs expected ones. c) Take advantage of the gap. **(iii) Quality improvement:** a) Put up evidence why it is necessary. b) Get the groundwork laid. c) Find the enhancement initiatives. d) Set up your project groups. **(iv) Provide the teams with resources, training, and motivation to:** a) Determine the root cause(s), and b) Rev up the treatments. Put safeguards in place to preserve the progress.

Effective quality management requires the systematic preparation, enhancement, and regulation of quality-related activities. Process control is established at an agreed-upon level of quality performance; from there, project-specific enhancement strategies are developed and implemented.

To boost customer happiness, he presented the "Ten Steps to Quality Improvement," which include the following: 1. Create an understanding of the potential for change; 2. Make plans for betterment; 3. Establish a quality council, pinpoint issues, choose projects, assign individuals to teams, and choose leaders; 4. Offer instruction; 5. Create and implement plans to address issues; 6. Provide updates; 7. Show appreciation; 8. Share your findings; 9. Do the math and; 10. Keep the ball rolling by integrating continuous improvement into your company's everyday operations.

He focused on both external and internal clients, not only the final buyer. From the initial product developer to the end consumer, everyone in between is a supplier or a customer. Furthermore, the individual will be a process, engaged in some kind of change or action.



Philip Crosby



Philip Bayard Crosby is widely recognised for his "Zero Defects" and "quality is free" theories. He held that an effective quality management must be "based on prevention- based system" and that errors can arise from a lack of employee knowledge and focus. According to Crosby, "quality is not compared," adding that "quality in terms of goodness, feel, elegance, and richness" do not exist. Crosby's four absolutes, drawn from his Total Quality Management philosophy, are summarised below in light of his notion of "Zero Defects."

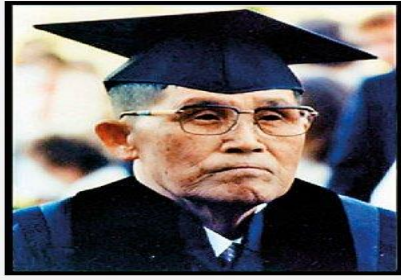
- a) Conformance to requirements is the definition of quality, not goodness or elegance.
- b) A quality system is one that emphasises prevention rather than evaluation. Good quality management (TQM practises) may help avoid potential problems;
- c) The goal should be "Zero faults" in terms of quality performance, although anything near would do. Rather than "that's near enough," It is unacceptable to make mistakes and;
- d) The cost of nonconformance is the true quality indicator.

Crosby said that management is responsible for 80 percent of an organization's quality issues, hence their focus should be on fixing such issues. In the same vein as Deming and Juran's suggestions for enhancing quality, Crosby proposed a set of 14 directives for business leaders to follow.

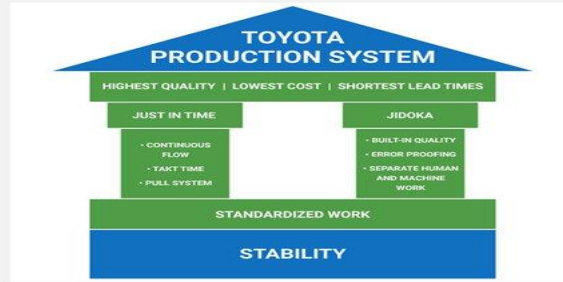
1. To make it apparent that management is committed to quality; 2. To raise the standard of cross-departmental collaboration, "quality improvement team" means: 3. Measuring performance in order to guarantee quality enhancement is what we mean when we say "quality measurement." 4. Quality cost measurement inside an organisation for management purposes; 5. "Quality awareness" means raising workers' level of understanding about quality. 6. "Corrective action": to offer a methodical approach to resolving issues. 7. "Zero defects action" means showing unwavering dedication to the zero faults initiative. 8. Employee training: identifying the most effective ways to improve the quality of training for managers. 9. "Zero Defects Day" is an initiative aimed at making the "Zero Defects" (Do the right things at the right time) message tangible to all workers. 10. "Goal setting": allowing everyone in the office to set personal and team objectives for betterment; 11. The goal of "error-cause elimination" is to ensure that all employees are effectively communicating with management in order to identify quality issues and provide workable solutions. 12. "Recognition": expressing gratitude to those who have carried out their responsibilities with excellence; 13. "Quality councils": to form quality councils for frequent communication, and; 14. Repeat the process to demonstrate to your staff that your commitment to quality improvement is ongoing.

Crosby defined the several stages of management of quality maturity, which may be used to evaluate an organization's level of excellence management development. These are the five stages of quality management maturity:

1. Unpredictability; 2. Awakening; 3. Illumination; 4. knowledge and 5. assurance. Several other metrics, including management comprehension and attitude, quality organization status, issue handling, cost of quality as a proportion of sales, and total firm quality posture, may be used to evaluate the business's progress through these phases.



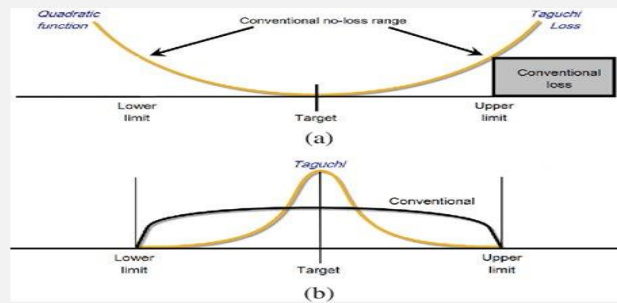
Shigeo Shingo



When it comes to Just-in-Time production, he is almost synonymous with the concepts of the Poka-Yoke (error proofing) system and the single minute exchange of die (SMED) system. Defects are investigated, production is halted, and quick feedback is provided via Poka Yoke to help pinpoint and eliminate their causes. The inclusion of a checklist acknowledges that people are fallible and forgetful. The goal of Poka-Yoke is to prevent mistakes from evolving into defects, which he differentiated from "errors," which are unavoidable but do not reach the consumer. There is a cause-and-effect link between human mistake and the presence of defects. Poka-Yoke & source inspections are necessary for the ideal manufacturing system of zero quality control. In the latter, mistakes are examined before they can become faults, and either the system is put on hold while the problem is fixed, or the incorrect condition is modified automatically.



Genichi Taguchi



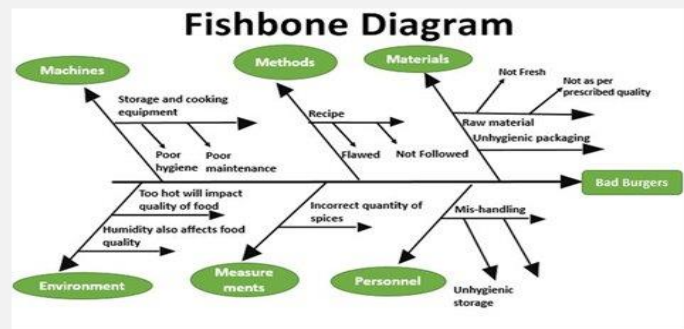
Dr. Genichi Taguchi argued that rather than trying to control all the various variations that occur during real production, it is better to create a product that is resistant or insensitive to variations in the process of production. He did this by taking previously existing information about experimental design and making it more accessible and applicable for quality professionals, therefore putting the theory into practise. He divided off-line quality in three stages: design, development, and production. This shifts the focus of quality and dependability back to where it belongs: the design phase.

- i. System design
- ii. Parameter design
- iii. Tolerance design

Taguchi technique is essentially a prototype process that helps designers determine the best parameters for making a product that will last through several iterations of production and still satisfy the needs of the end user. Taguchi methodologies, which may be seen along a continuum, are now closely linked with quality function deployment (QFD) in the eyes of many businesses.



Kaoru Ishikawa



Among Dr Kaoru Ishikawa's numerous contributions to quality management are the following: the "seven fundamental tools of quality" framework, the "whole quality perspective," company-wide quality control, a focus on the human element of quality, the Ishikawa diagram" or the Ishikawa diagram.

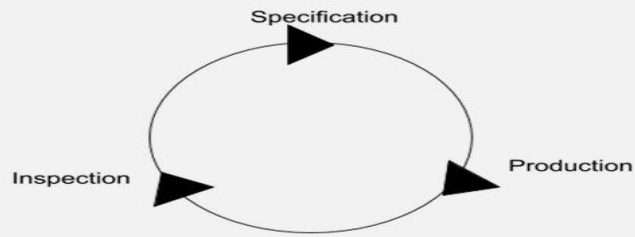
- i. Pareto analysis = which problems are big?
- ii. Cause and effect diagrams = Causes of problems?
- iii. Stratification = How data is made up?
- iv. Check sheets = How often it is done? Or occurs?
- v. Histograms = How do overall variation looks like?
- vi. Scatter charts = What is the relationship among factors?
- vii Process control charts = Which are the variations who controls and how?

He felt that these seven methods should be well-known across an organisation and utilised to diagnose issues and provide solutions. When combined, they make for a formidable toolbox.

- i. Venn diagram;
- ii. Inverse causation chart (Ishikawa chart);
- iii. Grouping diagram;
- iv. The scatter plot;
- v. a checklist;
- vi. and the histogram;
- vii. Calliper of control



Walter Andrew Shewhart

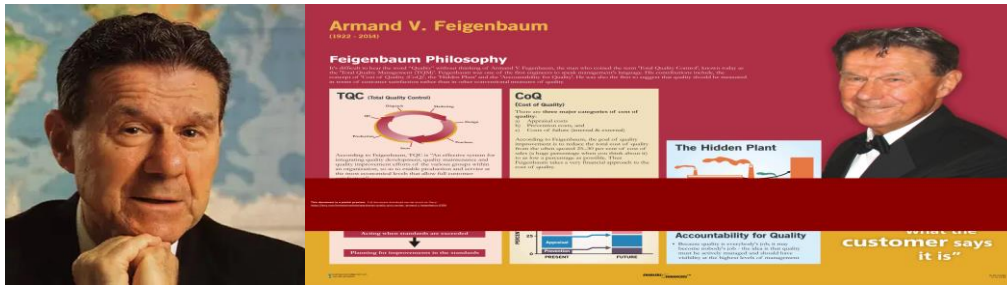


The term "statistical process control" was used by Walter Shewhart to describe the practice of using statistical techniques to monitor and regulate industrial processes in order to create things with consistent quality. Shewhart also proposed the use of "control charts," graphical aids for tracking a process's results over time and seeing when things have gotten out of hand. His concepts have had a major impact on the evolution of quality assurance practices in a variety of businesses throughout the globe.



Taiichi Ohno

Japanese industrial engineer & businessman Taiichi Ohno is credited for helping create the Toyota Production System (TPS). Ohno pioneered the TPS, an approach to production that seeks to eliminate inefficiencies and waste. Both the "just-in-time" manufacturing strategy of making just what is required at any given moment and the "kanban" system are often attributed to him. This visual communication system is used in factories to facilitate the smooth movement of products. Many businesses throughout the globe have implemented some of Ohno's suggestions, which have greatly influenced the manufacturing industry.



Armond V Feigenbaum

Dr. Armand V. Feigenbaum was a quality expert from the United States. His time at GE shaped his ideas into something really groundbreaking. complete quality management, often known as complete quality control, was first proposed by him. He described it as "an effective system for combining quality growth, quality maintenance, and quality improvement activities of the different units within an organisation to enable manufacturing and client service at the most affordable levels that allow maximum customer satisfaction."

Total quality management (TQM), the current iteration of total quality control, has been extensively adopted as a viable operational philosophy across all economic sectors and is almost synonymous with Feigenbaum's name.

In 1951, Feigenbaum released his first book, the "Quality Control Handbook," and became known as the "guru" who first presented the notion of "Total Quality Control" (TQC). The Japanese adopted this outlook, along with the notion of "Company Wide Quality Control," in the 1980s. His theory is on a "prevention-based approach" that places a premium on designing high-quality products and services and optimising the processes at their origin. To ensure that the goods are in line with "pre-defined standards" (such as ISO 9000), this approach relies on documentation and audits. The importance of everyone in the company, from secretaries to engineers to factory employees, was something that Feigenbaum emphasised as well.

The fundamental ideas of Feigenbaum's systematic approach for quality as follows: (i). Quality is an organisational endeavour; (ii). What a consumer values most is what defines quality. (iii). Price and value are inseparable; (iv). Excellence calls for fierce devotion from every member of the team. (v). Managing with quality is an approach. (vi). Innovation and quality go hand in hand; (vii). Integrity in production; (viii). Constant refinement is essential for quality; (ix). Productivity may be increased with the least amount of money and resources spent on it by focusing on quality, and (x). Quality is achieved by a comprehensive system that involves both clients and vendors.

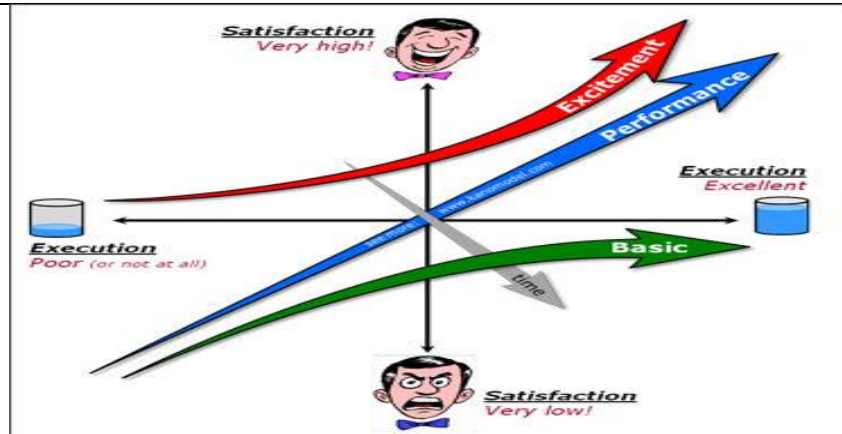
He emphasised "a system approach to quality," also known as "TQC," which consists of the following major phases for effective quality management:

Setting quality standards:

- i. evaluating how well something fits these criteria;
- ii. responding when expectations aren't reached, and;
- iii. Efforts are being made to raise these benchmarks.



Noriaki Kano



Dr. Noriaki Kano is the only professional in the world who is Honorary Member of International Academy for Quality (IAQ), American Society for Quality (ASQ) and Japanese Society for Quality Control (JSQC) the three most prestigious quality societies of the world. This is the highest honor these societies bestow on quality professionals. He is honorary member of many societies of quality professionals in Europe, Asia and Americas; and visiting professor at various prestigious universities in Europe, USA and Asia.

Dr. Kano is the founding President of the **Asian Network for Quality (ANQ)** and Honorary Chairperson since **2005**. He has been Board Member of **Union of Japanese Scientists and Engineers (JUSE)** since **2011** and The Overseas Human Resources & Industry Development Association (**HIDA**) (**2007-12**) the two most prominent organizations promoting quality in Japan and overseas.

Prof. Kano is an honorary advisor to various quality bodies of other countries like China and India and has **made positive contribution for development of quality around the world providing consultation, keynote speeches and conducting seminars in 84 countries.**

Prof. Kano has been the Chairman of the selection committee for Deming Prize for individuals since 2011 and Chairman of Deming Application Prize Committee for two terms ie. 2004 to 2007. These are considered the most prestigious awards in the field of quality management in the world.

Accomplishments:

Dr. Kano has been **Board Director of Komatsu Ltd.** for 6 years and been **Corporate Auditor at Sekisui Chemical Ltd.** for 6 years. A very rare accomplishment indeed.

He is best known for development of **Attractive Quality Creation** that is popularly known as **Kano Model / Method** and very widely used around the world in development of new products and services in all sectors of economy. Another important approach developed by Dr. Kano for breakthrough improvement is called the Task Achieving QC Story. He has **published** over 300 papers and books including "Attractive Quality" (Kano Method / Kano Model)", "Guide to TQM in Service Industries" (in English) and "Way to Breakthrough and Creation" (in Japanese)

Dr. Kano has helped many **multinational companies from Japan, USA, Europe, Taiwan, Thailand, China and India** besides other countries to enhance their business performance using quality management approaches.

Dr. Kano continues his **research activities** to find new ways to improve organizational performance based on quality management theory and practices. Over the last 4 to 5 years he is **developing new methodologies and tools that enable effective use of Information and Communication Technologies (ICT)** to make breakthrough improvements. He develops these methods jointly with his client organizations. In some countries similar methodologies are called Quality 4.0. He is ahead of the rest in this field.

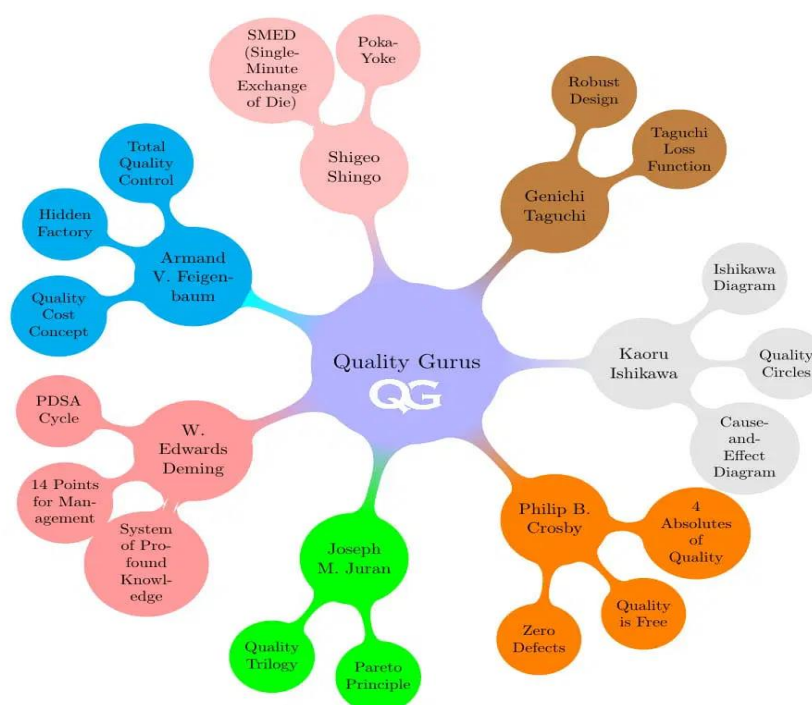
Honors:

Eponymous Dr. Kano has the unique distinction of Awards being established in his name:

- 2010 Ishikawa-Kano Award Established by Asian Network for Quality (ANQ)
- 2009 Kano Quality Award Established by Technological Promotion Association (TPA, Thailand)

Following is some important Web Pages which contain more useful/interesting INFO

- 01] <https://www.qualitygurus.com/9-quality-gurus-and-their-contributions/>
- 02] <https://www.bizmanualz.com/improve-quality/who-are-the-top-quality-gurus.html>
- 03] <https://www.linkedin.com/pulse/architects-quality-meet-9-gurus-qualitygurus-com>
- 04] https://iaeme.com/MasterAdmin/Journal_uploads/IJM/VOLUME_10_ISSUE_5/IJM_10_05_036.pdf
- 05] <https://www.focusstandards.org/quality-gurus-key-contributions/>
- 06] <https://irgst.org/articles.aspx/2571/Quality%20Gurus%20and%20their%20Contributions>
- 07] <https://www.scribd.com/doc/45079947/Top-Ten-Quality-Gurus>
- 08] <https://www.linkedin.com/pulse/quality-gurus-abdur-rahman-farooq>
- 09] <https://www.encyclopedia.com/management/encyclopedias-almanacs-transcripts-and-maps/quality-gurus>
- 10] <https://better-operations.com/2013/02/26/quality-gurus-on-quality-management/>
- 11] https://isqnet.org/about-us/governing-council/dr_noriakiKano.html



"The Architect of Quality"

Source: <https://www.juran.com/about-us/dr-jurans-history/>

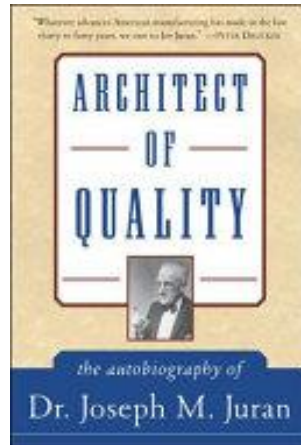
Born in Romania in 1904 before emigrating to Minnesota in the US in 1912, from an early age Dr. Joseph M. Juran displayed a keen interest in learning and developing leadership skills. A snippet of Dr. Juran's history:

- In 1924 Dr. Juran graduated with a degree in electrical engineering and was hired by Western Electric's Hawthorne Works (later became AT&T). It was there that he began working on his Universal Principles which began with the Pareto Principle. This early introduction to quality analysis and management would go on to shape the rest of his life.
- After WWII, Juran became a professor of industrial engineering at New York University, teaching quality management. Dr. Juran's work in the field of quality management drew particular interest in Japan, and in 1954 he went there to discuss his theories at the invitation of the Japanese Union of Scientists and Engineers.
- He would make a further nine visits to Japan to teach his quality management techniques, which became firmly embedded in the nation's engineering and manufacturing industries.
- Dr. Juran founded the Juran Institute – now simply called 'Juran' – in 1979.
- Dr. Juran remained active in the field of quality management well into his 80s consulting for top-tier organizations worldwide, including the Armed Forces, Rolls-Royce, Toyota, Motorola, Corning to name a few.
- He retired at 90, but spent the following years writing his memoirs, which were published just before his 99th birthday.
- Dr. Juran passed away in 2008 at the age of 103, but his work in the field of quality leadership continues to move forward by the Juran Team led by Joseph A. DeFeo

Dr. Juran remained active in the field of quality management until his passing at 103!

Consulting for top-tier organizations worldwide, including Xerox, the US Navy, Rolls-Royce Motors and Toyota. He retired at 90, but spent the following years writing his memoirs, which were published just before his 99th birthday.

Juran died in 2008 at the age of 103, but his work in the field of quality improvement is being carried forward by Dr. Joseph A. DeFeo, Chairman and CEO of Juran. With over 35 years of experience in training, coaching and consulting, DeFeo's highly regarded text, Juran's Quality Handbook: The Complete Guide to Performance Excellence is widely considered the go-to resource for those wishing to study Dr. Juran's quality management principles.



"Architect of Quality" is the autobiography of Dr Joseph Juran. Juran's autobiography is the moving story of a Romanian immigrant to the USA who rose from poverty to being a world leader in quality and receiving honours from the Emperor of Japan and the President of the USA. Those of us who work in quality have much to learn from him.

Juran worked at Bell Telephones Hawthorne works at the same time as [Walter Shewhart](#) was working there and while [W. Edwards Deming](#) was an intern there. That three of the giants of quality were working at the same plant at the same time has always seemed remarkable to me. I learned from "Architect of Quality" that this occurred when Bell Telephones were building the first national telephone system for the United States of America. Bell Telephones Hawthorne plant would, at that time, have been the electronics hub for the USA. It would seem that these three giants all came to work at the plant due to the scale of the engineering task that Bell Telephones were undertaking.

Bell Telephones used statistics to develop their systems. Juran describes how Walter Shewhart invented [Control Charts](#) at Bell Telephones as a way to improve quality and how the use of statistics at Bell Telephones led to the creation of Statistical Quality Control.

Juran found his knowledge of mathematics extremely valuable in several different ways. There is an entertaining section in the book where he describes how he used his knowledge of mathematics to win on roulette tables that were run by Al Capone.

Writing was important to Juran and he describes how he came to start to write editions of Juran's Quality Control Handbook. The Handbook is a reference book for all who are involved in quality, and each edition of the Handbook has sold tens of thousands of copies. I have three editions of the Handbook and find them to be useful books to consult when I want to consider an issue more deeply.

He, along with W. Edwards Deming, helped to rebuild the Japanese economy after World War Two and in his autobiography, he describes the lectures and courses he gave in Japan. He also writes about Deming's work in Japan. Lloyd Dobyns and Clare Crawford-Mason's overview of Juran and Deming's work is more valuable because it is written from the viewpoint of a third party who is trying to understand the work of the two men.

Universal methods were something that interested Juran. This interest came from his knowledge of mathematics. He describes how this led to him creating universal methods in management planning and control.

References:

- [1] [Architect of Quality : The Autobiography of Dr. Joseph M. Juran](#) by Dr Joseph Juran
- [2] [Quality or Else](#) by Lloyd Dobyns and Clare Crawford-Mason

THREE Important Features of the BOOK

- [Brutal honesty of narration](#): When you are a legend, it is easy to write with a tone, "What did I do right to become great?" However, it is much more difficult to look at the movie of your life dispassionately and avoid the blame-game. For example, Juran narrates a story when his career seemed to have hit a plateau at Western Electric (an AT&T company). This was the first time in his career that a vacant slot above him gets filled by someone other than Juran and it shattered his belief that promotion is an entitlement. It made Juran to go into a "revenge" mode for some time. Looking back after 60 years, Juran tries to answer: "Where did the revenge emotion come from? What did I not understand at that time?" In this process, he uses data he gathered from his bosses and subordinates much later on the perceptions people carried about him (tactless & arrogant). I found this approach of writing impressive.
- [Evolution of "process capability" as an idea](#): One of the core contributions of Juran is the concept of "process capability". It was a radical innovation that demonstrated that you can improve productivity systematically without adding any machinery, workers or material. It made a huge impact in Japanese industry in 50s and 60s, for American industry in 70s and 80s and to the rest of the world later. Juran traces beautifully the conception of this idea, difficulties faced in getting it adopted in his own organization, role of professional societies like Society of Advancement of Management (SAM), American Management Association (AMA), Japanese Union of Scientists and Engineers (JUSE) etc. in spreading the idea and the role of consulting projects and books Juran wrote in establishing the idea.

- [A powerful lens to look at last century](#): Juran came from a Jewish immigrant family and lived for 104 years (1904-2008). His first ten years were spent in poverty and he lived in Minneapolis's red-light area for 4 years with his dad after his mother's death. His first car was Ford Model-A (bought in 1929), his company's strength came down from 40,000 to 7,000 during Great Depression (he survived the lay-offs), he was engulfed by fears of anti-Semitism during world war-II, he decided to become a freelance consultant when it wasn't an established practice (1945), in 2001 Juran celebrated 75th wedding anniversary with his wife Sadie. Juran wrote the last chapter of this book in 2003. This vast canvas makes the book an amazing lens to look at the last century.

[Please visit the following Web Pages for MORE INFO](#)

<https://www.caho.in/articles/dr-j-m-juran-architect-of-quality>

<https://testandanalysis.home.blog/2023/01/24/a-review-of-dr-joseph-jurans-autobiography-architect-of-quality/>

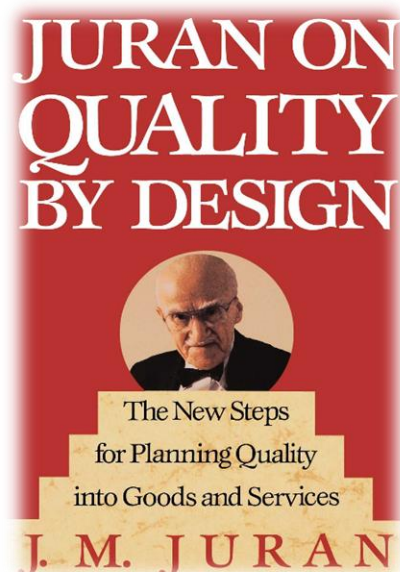
<https://www.proquest.com/docview/214757466?sourcetype=Magazines>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2565827/>

<https://search.worldcat.org/title/Architect-of-quality-:-the-autobiography-of-Dr.-Joseph-M.-Juran/oclc/52877405>

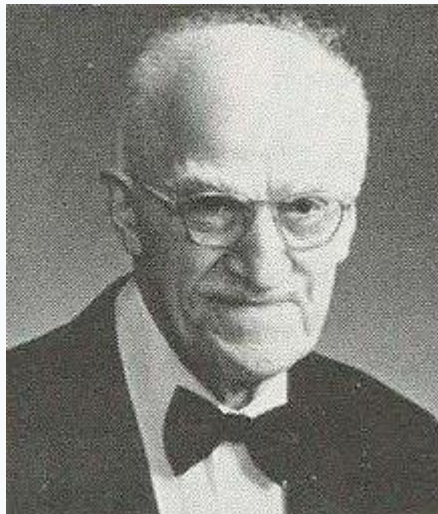
<https://www.nae.edu/187336/JOSEPH-M-JURAN-19042008>

<https://www.abebooks.com/9780071426107/Architect-Quality-Autobiography-Joseph-Juran-0071426108/plp>



Joseph M Juran

Joseph M. Juran



Juran circa 1987

Born	Joseph Moses Juran December 24, 1904 Brăila , Romania
Died	February 28, 2008 (aged 103) Rye, New York , U.S.
Occupation(s)	Engineer and management consultant
Spouse	Sadie Shapiro (m. 1926)
Children	4 (2 deceased)

"It is most important that top management be quality-minded. In the absence of sincere manifestation of interest at the top, little will happen below."

<<< [Joseph M. Juran](#)

Dr. Joseph M. Juran, renowned as the Architect of Quality, established the Juran Institute with a mission: to empower organizations in crafting high-quality products and services that benefit society as a whole. Throughout his career he was driven by the desire to solve business problems and pass his experience, insights and teachings on to others.

JOSEPH M. JURAN, founder of the Juran Institute for Leadership in Quality and a pioneer, teacher, consultant, and guru of quality control, died on February 28, 2008, at the age of 103. He was elected a member of NAE in 1988 for "pioneering contributions in developing the practice of statistical quality control, and in developing engineering design principles base on statistical concepts."



Joseph Moses Juran was born on December 24, 1904, in Romania. Eight years later, the family immigrated to Minneapolis to escape poverty and the threat of violence against Jews. Joseph became a naturalized U.S. citizen in 1917 and served as a second lieutenant, eventually captain, in the U.S. Army Signal Corps Reserve performing cryptanalysis.

He went on to become the world-renowned elder statesman of quality control. His 75-year career included 17 years at Western Electric, four years on loan to the Lend Lease Administration beginning soon after the attack on Pearl Harbor, and more than 50 years as a management consultant. Joseph was not only a pioneer in the field of quality control field, but was also one of the most revered leaders in the field.



Joseph Juran was elected to the National Academy of Engineering in 1988. In 1992, he was awarded the National Medal of Technology by President George H. W. Bush "for his lifetime work of providing the key principles and methods by which enterprises manage the quality of their products and processes." Even earlier, in 1981, he was awarded the Order of the Sacred Treasure by the emperor of Japan. That same year, he received the Frank and Lillian Gilbreth Industrial Engineering Award, the highest honor given by the Institute of Industrial Engineers. He also received the Grant Medal (1967), Edwards Medal (1962), and Brumbaugh Award (1958) from the American Society for Quality Control, any one of which is considered the capstone of a career; Joseph went on to contribute for another 40 years.

By the time he was 20, Juran had held 16 jobs, including his first job selling the Minneapolis Tribune at a streetcar stop. When he wasn't working, he continued to pursue his formal education. His teachers kept moving him ahead to challenge him, and in 1920 he entered the University of Minnesota, where he received his B.S. in

electrical engineering in 1924. College was a challenge, and maintaining a C average was sometimes a struggle, as he continued to work to make ends meet. In 1926, he joined the inspection statistical department at Western Electric, one of the first such departments ever established.

In 1929, at the age of 24, Joseph was appointed chief of Western Electric's Quality Inspection Results Division, which oversaw five departments. In 1935, still working at Western Electric, Joseph earned a J.D. from Loyola University. Practicing law was his backup employment plan during the depression. In 1937, he moved to New York to become corporate industrial engineer at Western Electric/AT&T headquarters. About this time, he also became active in the Society for the Advancement of Management, American Management Association, and American Society of Mechanical Engineers.

In 1941, while on a benchmarking visit to General Motors, he discovered the work of Vilfredo Pareto on the distribution of wealth (that relatively few people own the great majority of the wealth). He applied this principle to quality by showing conclusively that relatively few contributors (e.g., components) in a system—the vital few—account for the bulk of the effect (e.g., defects). He later discovered that this principle had been incorrectly attributed to Pareto, but more than 50 years later, when he was asked if the name should be changed to the "Juran principle," he said, "No, but perhaps after I go to the great beyond."

The same year, 1941, he was "loaned" by Western Electric to the Lend Lease Administration for six weeks, starting on Christmas Day. As World War II continued, the six weeks stretched into four years.

From 1945 to 1949, Joseph began his career as a consultant, assisting clients such as Gillette, BorgWarner, and Hamilton Watch Company. During this time he became a founding member of the American Society for Quality Control (ASQC). From 1949 to 1979, he had his own consultancy. Beginning with clients such as General Foods, Bausch and Lomb Optical, and International Latex., his client list quickly grew to include many North American and international organizations. From 1950 to 1991, he made 178 trips abroad to lecture, consult, teach courses, and attend quality conferences in 34 countries.

In 1979, Joseph incorporated the Juran Institute for the purpose of transferring his knowledge to a set of 16 videotapes, the "Juran on Quality Improvement" package, which included 50 workbooks, two leader's manuals, and three books. The Juran Institute eventually expanded to offer consulting services, workshops, papers, and additional books and tapes. In 1987, Joseph stepped down from his position as chairman and CEO of the institute to become chairman emeritus. From 1988 to 1991, Joseph was tapped to serve as a founding member of the U.S. Malcolm Baldrige National Quality Award Board of Overseers.

Joseph's writings number in the hundreds, many of them translated into 30 different languages. His books span nearly 60 years, beginning with *Bureaucracy: A Challenge to Better Management* in 1944 (probably still relevant today) and ending with his memoirs, *Architect of Quality*, published in 2003. *Juran's Quality Control Handbook*,

which has been published in many editions since it first appeared in 1951, is still considered the definitive compilation on quality. Quality Planning and Analysis, published in several editions since 1970, is used throughout the world by both practitioners and academics.

According to Joseph's son Donald, his father always told him, "Never be without a project." Speaking a few days after his father's death, Donald added, "And he never was." Joseph's contributions were motivated by his strong underlying beliefs developed over many years of helping people.

Joseph's vision for this country was that the 21st century would be the "Century of Quality." In 1994, he had argued for a national center for the study of quality. In 1997, he realized this ambition when the Carlson School of Management at the University of Minnesota established the Joseph M. Juran Center for Leadership in Quality. The centre focuses on rigorous research, educating scholars, and the discovery, dissemination, and teaching of quality leadership in the United States and around the world.

In 2000, the American Society for Quality (ASQ) introduced the Juran Medal in Joseph's honour. The medal is awarded to individuals who "exhibit distinguished performance in a sustained role as an organizational leader, personally practicing the key principles of quality and demonstrating breakthrough management." In 2000 the recipient was Robert W. Galvin, and in 2003 the recipient was John A. Young, both NAE members.

Married for 81 years, Joseph is survived by his wife Sadie, four children, and many grandchildren and great-grandchildren.

On his death [28 Feb 2008], his friend & an ASQ member, Joaquim Donizetti Donda reacted:

"Heaven will get better."

Kindly visit the Web Page to know
Highlights from Juran on Quality Leadership
<https://www.youtube.com/watch?v=LJ2Hj4RiPiM>

<https://www.juran.com/about-us/dr-jurans-history/>

<https://www.juran.com/>

<https://asq.org/about-asq/honorary-members/juran>

<https://blog.lifeqisystem.com/joseph-juran>

<https://www.nae.edu/187336/JOSEPH-M-JURAN-19042008>

<https://www.qualitygurus.com/joseph-juran/>

Contributions of JURAN

Contributions to Quality Management

[a] Pareto principle: In 1941, Juran applied the Pareto principle to quality concerns in the organization: 20% of the causes are responsible for creating 80% of the problems. This is also popularly quoted as “the vital few and the trivial many.” In the later years, Juran used this quote to signal that the remaining 80% of the causes cannot be ignored.

[b] Management theory: Juran is widely acknowledged for the addition of the human dimension to quality management. He advocated the training and education of managers. Juran proposed that human relations problems are supposed to be isolated and that the fundamental cause of quality issues was resistance to change. Juran’s concept of quality management can be extended outside the factory to encompass non-manufacturing processes and those that are service related.

[c] The Juran trilogy: Juran was one of the first to point out the cost of poor quality. He illustrated this concept in “Juran trilogy,” a cross-functional management approach, constituted of three managerial processes: quality planning, quality control, and quality improvement. He pointed out that without change, there will be a constant waste. However, margins will be higher and the increased costs are recouped after the improvement.

[d] Transfer of quality knowledge between East and West: He became aware of the concept of quality circles during his visit to Japan in 1966. He preached this concept with enthusiasm in his assignments in the West. He acted as a moderator between the U.S. and Japanese companies looking for mutual and professional introductions to each other.

His Lasting Impact on Quality Improvement

Juran's Background

“Quality planning consists of developing the products and processes required to meet customer’s needs.”

Born in Romania in 1904, Juran immigrated to the United States when he was eight. His family settled in Minneapolis, Minn. Juran did well in math in school and became an expert chess player. After high school graduation, he earned a bachelor's degree in electrical engineering from the University of Minnesota.

He worked at Western Electric's Hawthorne Works, eventually moving into Bell Lab's statistic-driven quality control department. His job involved working with a team that tested quality improvement innovations. This early work essentially set the course of his life.

In the 1930s, he rose to the position of chief of industrial engineering. He also earned a law degree from Loyola University Chicago School of Law, but never practiced.

During World War II, Juran worked for the government's Lend-Lease Administration, focused on streamlining shipment processes. But, more importantly, during this time he came across the works of 18th century Italian economist Vilfredo Pareto.

Pareto's Principle

"The vital few and the trivial many."

By the time Juran had left regular office work to become a consultant on quality improvement, he had developed a theory that Pareto's 80/20 principle could be applied to any organization's operation.

For example, he argued that most defects are the result of a small percentage of the causes of all defects, according to the Economist. For another, 20% of a team's members are going to make up 80% of a project's successful results. And 20% of a businesses' customers will create 80% of the profit.

Juran felt organizations, armed with that knowledge, would focus less on meaningless minutiae and more on identifying the 20%. That means eliminating the 20% of mistakes causing the majority of defects, rewarding the 20% of employees causing 80% of the success and serving the 20% of loyal customers that drive sales.

In a way, Pareto's Principle puts numbers to the idea that in business, as in life, things are not evenly distributed. Pareto was studying land ownership in Switzerland. But Juran saw that it applied to business, as well.

A Focus on People

"It is most important that top management be quality-minded. In the absence of sincere manifestation of interest at the top, little will happen below."

Despite his expert knowledge in math and statistics, Juran emphasized people. He learned early on that the biggest roadblock to process improvement is not the tools of the trade, but rather the need to make a cultural shift among the people involved.

That started at the top. Juran felt a major impediment to quality improvement is a disengaged upper management set in its current ways.

As usual, the highly quotable Juran summed up the situation well. In addition to the quote at the start of this section, Juran also had this to say about the need for leadership at the top of an organization:

"Observing many companies in action, I am unable to point to a single instance in which stunning results were gotten without the active and personal leadership of the upper managers."

Juran Trilogy

"Goal setting has traditionally been based on past performance. This practice has tended to perpetuate the sins of the past."

In his focus on people and how they work in processes, Juran took a different approach than others working in the growing quality improvement field. In doing so, he completely changed how companies looked at reducing inefficiencies.

Juran found the hidden costs in how companies tended to deal with defects. In the early 20th century, that often meant dealing with the issue after it had occurred rather than focusing time and money on making quality improvements to keep defects from happening.

He also felt that the resulting poor product quality cost companies more than they fully accounted for, including damage to a company's reputation that led to a loss of customers.

He also advocated for creating operations that ran efficiently without the need for costly inspections.

He developed the Juran Trilogy, which involved three principal areas:

Quality planning – This involves identifying your customers, determining their needs and developing products that respond to their needs.

Quality improvement – Develop a process to create the product and then optimize that process.

Quality control – Create a process that can operate under minimal inspection.

The Juran Trilogy was formally published in 1986 and quickly became established as a must-read for those involved with quality improvement around the world.

Visit To Japan

"All improvement happens project by project and in no other way."

In 1954, Juran made a trip that literally changed quality and process improvement forever. He spoke to business leaders in Japan about his ideas on quality improvement and control. While he had done this in other places, the Japanese took his message much more seriously.

In the subsequent years, Japanese business leaders developed the ideas that led to Six Sigma and Lean. They instituted process improvement methodologies that have since been copied around the world. While these Japanese leaders deserve the credit for developing these ideas, Juran also deserves credit for sparking the ideas.

Over the years, Juran also wrote books. Further insight into his ideas can be found in the pages of the "Quality Control Handbook," "Juran's Quality Handbook" and "Managerial Breakthrough: A New Concept of the Manager's Job."

In 1979, Juran established the Juran Institute in Connecticut. The institute is a training, certification and consulting company that focuses on quality management, including Lean and Six Sigma.

One of the best quotes about Juran comes from Joseph De Feo, the CEO of the Juran Institute, upon Juran's death. He said: "Dr. Juran recently told me that he wanted everyone to know he had a wonderful life and hoped that his contributions to improving the quality of our society will be remembered."

Of that, there is little doubt.



For further INFO, please visit the following Web Pages

<https://www.juran.com/blog/quality-management-system/#:~:text=Juran-Dr.,quality%20control%2C%20and%20quality%20improvement.>

<https://www.slideshare.net/slideshow/joseph-juran-contribution-to-tqm/51275213#23>

<https://opexlearning.com/resources/joseph-juran-contributions-to-the-theory-of-process-improvement/27864/>

<https://www.quality-assurance-solutions.com/Joseph-Moses-Juran.html>

<https://www.sixsigmadaily.com/remembering-joseph-juran-quality-improvement/>

<https://www.linkedin.com/pulse/joseph-juran-pioneer-quality-management-sudip-paul-q8q1f>

<https://www.skymark.com/resources/leaders/juran.asp>

<https://academic.oup.com/edited-volume/37216/chapter-abstract/327588628?redirectedFrom=fulltext>

The Juran Trilogy

(Quality Trilogy)

Juran introduced the Juran Trilogy – or Quality Trilogy - in the late 1980s. This was a new way of thinking about quality, and also a way of managing quality. And is now the basis for much quality management work.

These are the three components of the Juran Trilogy:

Quality Planning – or Quality by Design

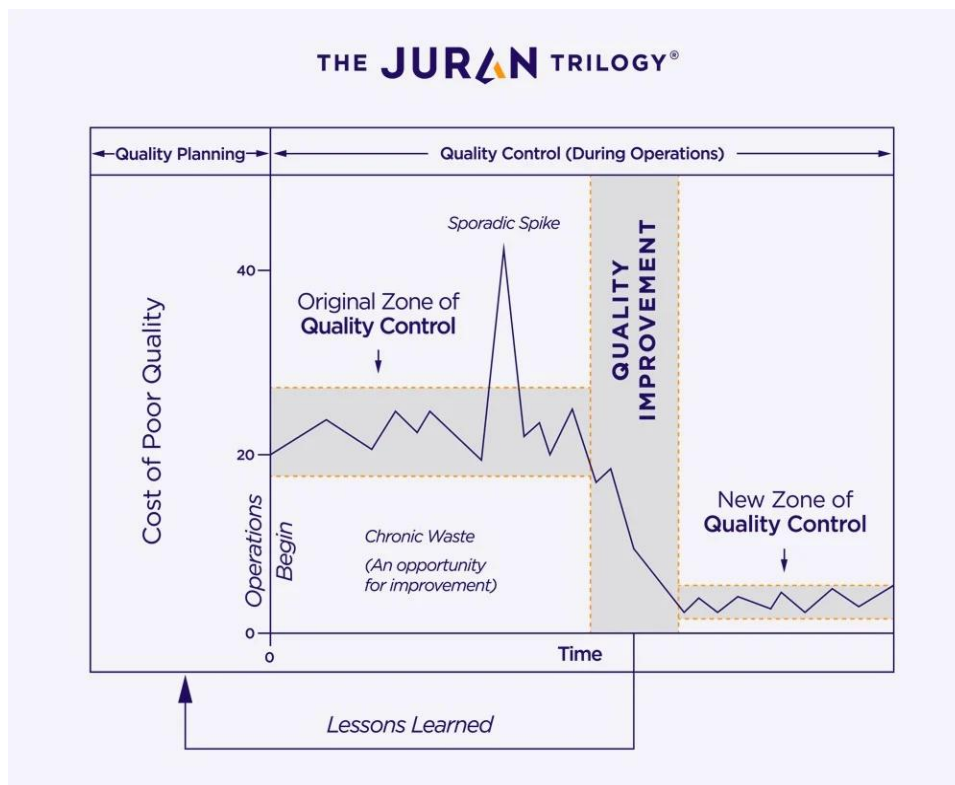
This is a structured method that relates to product or service development processes and is used in order to create new features that customers actually need. You may also know it as the 'Design for Six Sigma'.

Quality Improvement – or Lean Six Sigma

This is a focus on 'breakthrough' improvement, rather than everyday improvement. 'By attaining just a few vital breakthroughs year after year (The Pareto Principle), the organization can outperform its competitors and meet stakeholder needs.'

Quality Control - Process Control & Regulatory

'Today, the term "quality control" often means quality control and compliance. The goal is to comply with international standards.'



These THREE are explained briefly here:

1. Quality Planning

Quality Planning is the activity of developing the products and processes required to meet customers' needs. It involves:

- Establish quality goals
- Identify the customers- those who will be impacted by the efforts to meet the goal.
- Determine the customers' needs
- Develop product features that respond to customers' needs
- Develop processes that can produce those product features
- Establish process controls, and transfer the resulting plans to the operating forces

2. Quality Control

Quality Control is the activity of monitoring production activities to ensure that they are producing the correct product or service according to plan. It includes:

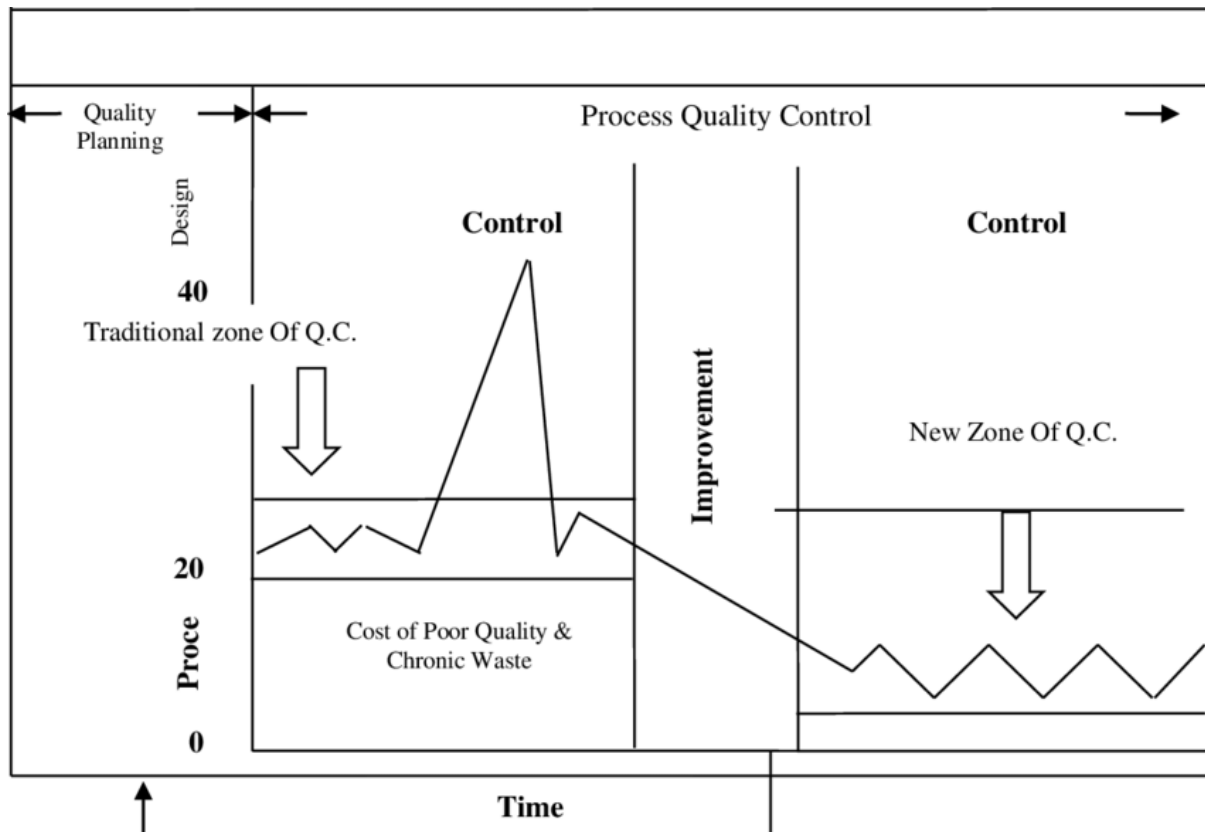
- Monitoring the performance of the processes
- Ensuring that all steps in the process are performed correctly
- Corrective action when necessary

3. Quality Improvement

Quality Improvement is the activity of making changes to improve the process and raising quality performance to unprecedented levels (breakthrough). This may involve:

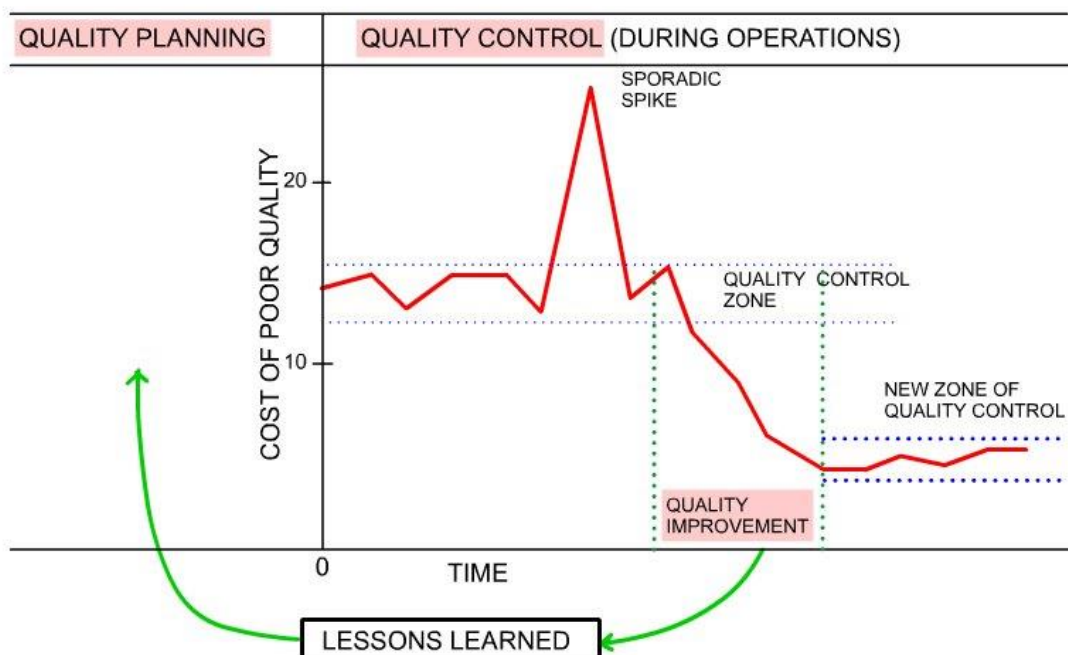
- Establish the quality improvement infrastructure
- Identify the improvement projects
- For each project, establish a project team with clear responsibility
- Provide the resource, motivation, and training needed by the team





Juran's three universal processes (Juran Trilogy)

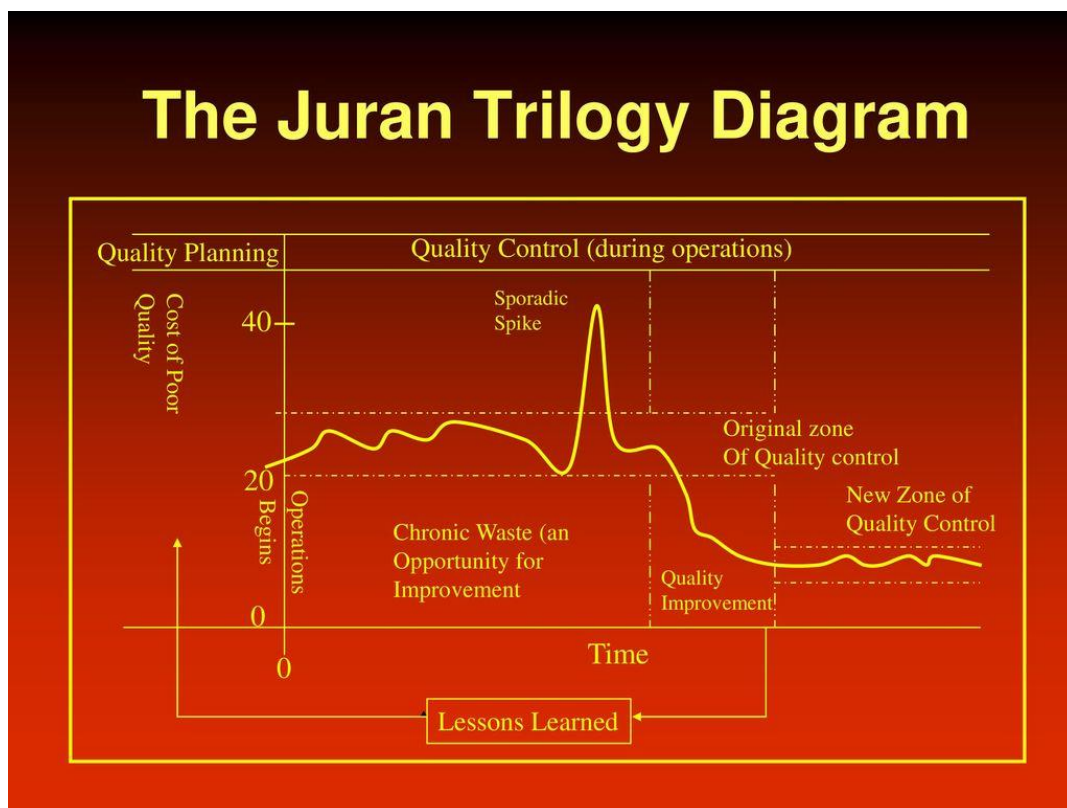
The Juran Trilogy Diagram



Juran Trilogy - We ask and you answer!



Juran Trilogy Quality Management Quality Planning Stock Vector



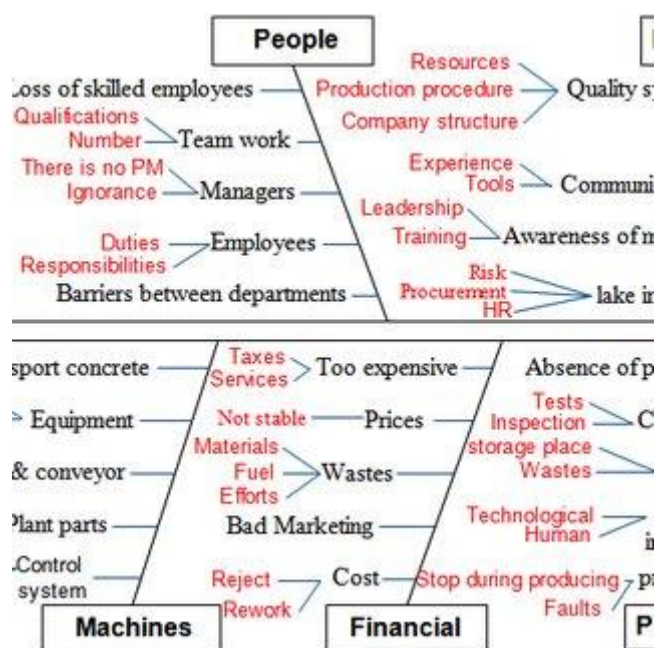
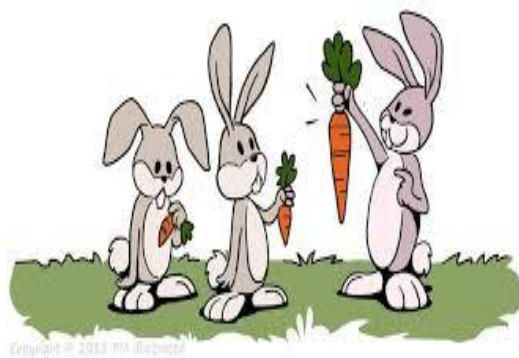
Continuous Process Improvement



Total Quality Management (TQM): A Strategic Approach



35 Top Influential Business Gurus



Quality control & Quality assurance.

Watch a Video on "Juran Trilogy"

<https://www.youtube.com/watch?v=GQmdg8xg1BQ>

Visit these Web Pages to know MORE!

<https://www.process.st/juran-trilogy/>

<https://checkify.com/blog/juran-trilogy/>

<https://www.juran.com/blog/the-juran-trilogy-2/>



Juran Technologies

Website

<http://www.arilsystem.com>

Industry

Machinery Manufacturing

Company size

11-50 employees

Headquarters

Rishon Lezion, ISRAEL

Type

Privately Held

Founded

1966

Specialties

Lychee, Potatoes, EcoLychee, Sulfur-free, Sustainability , Pomegranate Machinery, Pomegranate Arils, Fresh Defrost, SpudRoll, and Potato Separating Roller

Locations

Primary

23 Shmotkin Street

Rishon Lezion, ISRAEL 7536326, IL

Kindly visit the following Web Page containing 14 Videos covering the major/important activities of Juran Technologies

<https://www.youtube.com/channel/UCzwS-4-N346oCjscb-AaLbw>

Juran Technologies was founded in 1966 as a private family enterprise.

The plant is situated in Rishon Lezion, on Israel's coastal plain just south of Tel-Aviv.

The firm employs 35 skilled personnel, 8 of whom are qualified mechanical engineers and holders of degrees in management. In addition to their constant search for new ideas and solutions, the technical department's team of engineers serves Juran's customers solving specific problems, helping meet their needs, and dealing with any planning problems.

As part of its research endeavors, Juran enjoys a close relationship with the Agricultural Engineering Institute and over the course of 30 years of cooperative efforts has registered several joint patents.

Began in 2003 as a Juran led cooperative European/Israeli project aimed at addressing the issue of pomegranate aril extraction.

Juran Technologies joined forces with the Agricultural Engineering Institute of the Israel Ministry of Agriculture to explore the feasibility of automating aril extraction. Their aim was to produce an industrial capacity production line that would bring this super-healthy fruit to consumers while helping farmers and manufacturers realize its huge and varied market potential.

Juran Technologies

Juran is a world leader in the design and development of innovative machinery and processes for agricultural, industrial, and food processing applications.

Juran innovations impacting the food industry range from revolutionizing the freezing process, through enhancing dehydration methods, to groundbreaking automation.

With over 50 years' experience, operating on 5 continents and providing unparalleled service and customer support, Juran Technologies promotes enhanced productivity around the world.

Innovative Technologies for Post-harvest Treatment in the Post-Covid Era by Juran Technology

The COVID-19 has made food safety more important. In no doubt, postharvest treatment creates an opportunity for bacteria to enter. Juran Technologies wants to provide technological solutions that add value.

We're showing **TWO** of them this time:

[01] ArilSystem

ArilSystem is a pomegranate extraction system without human contact, developed in cooperation with ARO (Agriculture Research Organisation at the Ministry of Agriculture), and EcoLychee, an innovative technology to treat lychee peel without use of sulfur.



As a result of the COVID-19 period, the importance of food safety was greatly sharpened, as people throughout the world realized that sanitation and hygiene in the process of handling food after harvesting play an essential role in human health.

ArilSystem's mechanical extraction system eliminates human contact by putting pomegranates into one side and pomegranate arils into the other side, without touching the fruit. Furthermore, it is possible to integrate into the process – disinfecting materials that are approved for use in food, ensuring that the production is done in a hygienic environment.

The products that come out of a factory that uses this system have a higher chance of being at a high level of FOOD SAFETY and disease-free.

Based on a collaboration between Juran Technologies and ARO, the company has developed a pomegranate extraction systems for sale and service worldwide.

[02] EcoLychee



When handling fresh produce after harvest, utmost care must be taken to ensure that the product reaches consumers while still at peak quality and with optimal nutrient retention. We must ensure that no substances are involved in processing that could either negatively impact the finished product or otherwise prove harmful to consumers.

Sulphur for example is conventionally used after picking, to preserve the red peel color of Lychee fruit. Some people have allergic or asthmatic reactions to foods with sulphur in them and therefore this common practice can prove dangerous to some consumers.

There is however, another way to keep Lychee peel looking ripe and fresh. Juran has developed a sulphur-free method of treating picked lychee fruit which not only enables safe processing for consumers, but also provides an additional advantage – Juran's lychees have an extended shelf life of up to four or five weeks!

The lychee Sulphur Free Technology markets under the commercial name **EcoLychee**.

Vast and growing market opportunities

Fresh-Cut

Attractively packaged and offering a long shelf-life, pomegranate arils are rapidly growing in popularity in the fresh-cut market as a health food, a gourmet ingredient and a beautiful garnish.

Frozen Arils

Global production of frozen fruit and vegetables currently reaches 15 million tons, and is growing at a rate of over 3% annually. In the wake of strong public demand for healthy foods, frozen pomegranate arils are an increasingly popular trend in the food industry.

Juice

Fruit juice manufacturers who use arils produced by ArilSystem™ produce a higher quality, better tasting product.

Wine

A new line of wines using ArilSystem™ pomegranate arils has entered the market with remarkable flavor and added health benefits.

Medical

Among the health benefits of pomegranates is its ability to help reduce arterial plaque and help prevent its future build-up; it reduces hypertension; and it has been shown to possess anti-bacterial and anti-viral properties.

Pharmaceutical

The seeds, a by-product of pomegranate juice, are a rich source of oil which is a valuable ingredient for anti-aging creams and other cosmetic and pharmaceutical products.

Please visit the following Web Pages to know MORE

01] <https://israelagri.com/innovative-technology-for-post-harvest-treatment-in-the-post-covid-era-by-juran-technology/>

02] <https://www.juran.co.il/>

03] <https://il.linkedin.com/company/juran-metal-works-ltd.>

04] <https://www.arilsystem.com/#Market>





Juran Institute

[<https://www.juran.com/>]

Juran Institute and Attain Partners

We're an innovative training and consulting firm providing strategic guidance and technology solutions to help organizations move their journey to excellence forward.

Our Mission

Juran, An Attain Partners' Company's mission is to change the world by disrupting the status quo and improving the organizations and lives we touch.

Juran was built on Dr. Joseph M. Juran's scientific and pragmatic approach to attaining excellence. Dr. Juran was one of the key advisors to Toyota and many global companies. His research and pragmatic approach to improving organizational performance through management of quality led to his popularity which continues today. Dr. Juran passed away in 2008 at the age of 103, but he lives on through his Institute that is now entering its 45th year in operation.

"Superior quality always leads to sustainable business results."

Superior quality goods and services will result in sustainable financial results because goods and services that are superior to the competitors are salable. Goods and services that are salable because of quality continually drive revenue and maintain lower costs, leading to greater profitability. The pursuit of superior quality will transform the business and create a culture of excellence.

Superiority in quality from a customer perspective does not just happen. The business must make quality happen. Quality happens when the organization sets the strategic direction with a relentless pursuit to be the best in quality.

Organizations that attain superior results by designing, controlling, and continuously improving the quality of their goods and services are often called world-class or vanguard companies. They have achieved a state of performance excellence. Organizations that have attained a state of superior quality are well respected by customers because their products and services exceed customers' expectations, which leads to sustainable business results. This pursuit of excellence through quality management methods creates greater customer, stakeholder, and employee satisfaction, which enables the organization to sustain performance over a longer term.

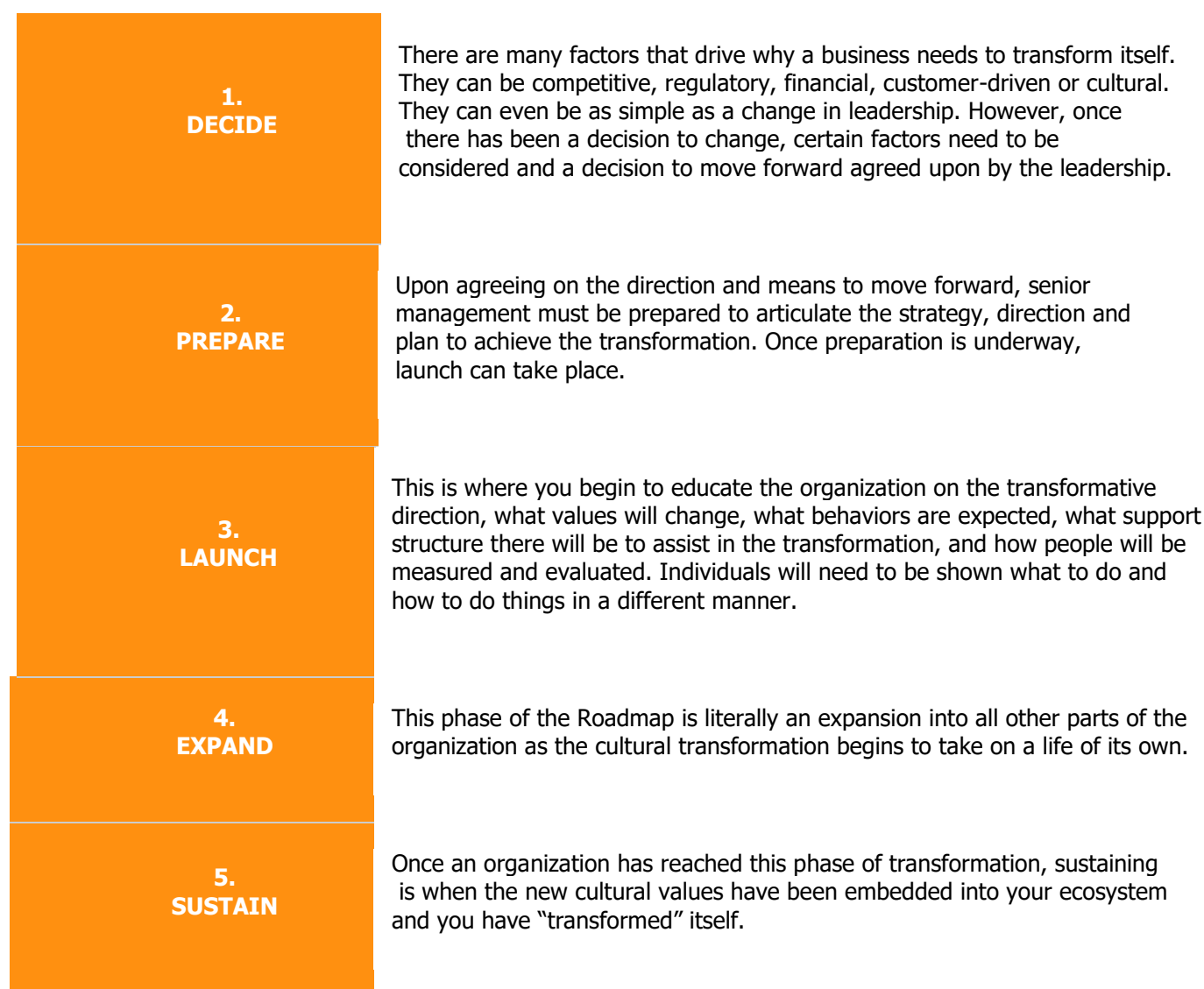
Managing Quality Is Not Optional

A common argument occurs among managers when asked, Does high quality cost more, or does high quality cost less? Seemingly they disagree. One-half agree that it costs more, and the other half feel it costs less. They are both right. The culprit is the word quality. It is spelled the same way and pronounced the same way, but has multiple meanings. To manage for superior quality and results, leaders must define the word quality from the perspective of customers—those people who buy the goods, services, and even the reputation of your organization.

Our Approach & Methods

The Five Phases of The Juran Roadmap

There are some fundamental things to consider when embarking on any corporate journey. They can be summed up in five simple phases, which we call the Juran Roadmap.



Our training and certification programs can be delivered at your organization or on line with our e-learning portal that we call IMPRO. We are able to transfer our knowledge and test your ability in a range of areas from Root Cause Corrective Action to the skills and methodologies of a Lean Six Sigma Master Black Belt.

Our programs are designed for many levels of an organization from candidates who want to learn the basics of quality to those looking to become masters of quality. Many of our programs can be taken online with access to a wide range of videos, publications, and courses. We offer 1-on-1 coaching and access to multiple Juran certified experts.

About the Institute

Founded by Dr. Joseph M. Juran, Juran Institute provides assessment, consulting, training, and certification to achieve quality leadership.

Website

<http://www.juran.com>

Industry

Business Consulting and Services

Company size

51-200 employees

Headquarters

McLean, Virginia

Type

Privately Held

Founded

1978

Specialties

Lean, Problem Solving, Cost Reduction, Innovation, Quality Improvement, Quality Control, Continuous Improvement, six sigma, quality by design, Quality 4.0, and QMD

Locations

Primary

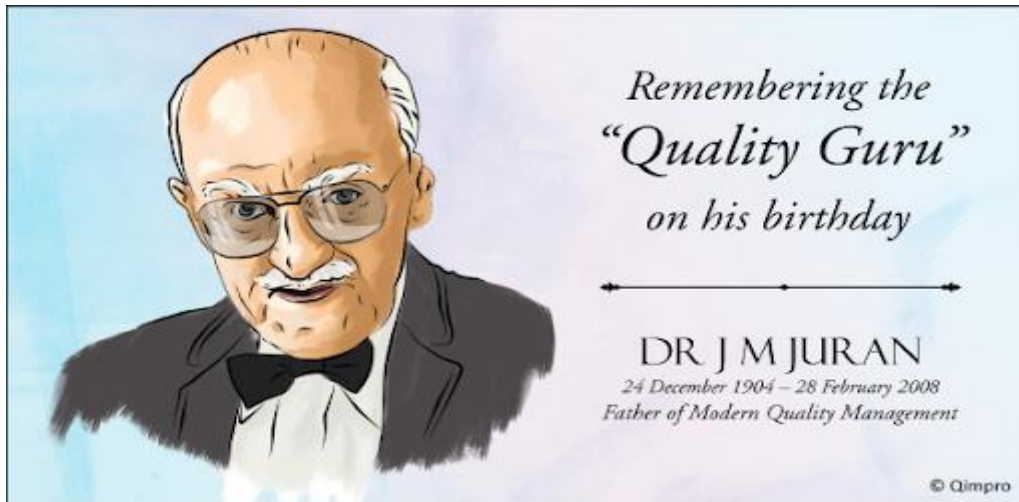
1650 Tysons Blvd

Suite 1530

McLean, Virginia 22102, US



Tributes to Juran



From:

Sam Black, 217 W, Northgate Rd, Peoria IL

Dr. Joseph M. Juran passed away last week in N.Y. at the age of 103. Dr. Juran was without doubt the world's leading authority on the Quality Sciences and spent 70 years of his long life teaching, writing and consulting to manufacturing industries throughout the world. After World War 11 he was invited by the US government to go to Japan to help the Japanese rebuild their industries. The Japanese understood that quality reliability comes from quality improvement and defect prevention rather than from inspection. As we know, the Japanese became world leaders in product quality on practically everything from miniature radios to automobiles that continues to this day.

Juran returned to the USA and was disappointed to find US manufacturers in a post war boom focusing on output with little time for quality improvement. For several decades thereafter American companies were largely ineffective due to upper managers' inability to correctly manage quality. Juran believed that quality improvements were key to businesses' survival and profits. Many once successful companies went belly up or suffered severe losses when they ignored or abandoned quality activities. Things began to change in the 1980s as discerning consumers demanded better quality and reliability from US built products. Caterpillar, Peoria, hired Dr. Juran to give advice on how to catch-up on their major competitors from Japan, resulting in a quantum leap forward on product quality.

I am confident that quality conscious companies will continue to benefit from the Juran principles well into the future. His monumental influence in the field of quality management will live on after him.

Joseph M. Juran Celebrates 100th Birthday

The Juran Institute Inc. will celebrate the 100th birthday of Joseph M. Juran, the organization's founder and a pioneering architect of quality management.

The celebration, slated for May 6, 2004, encompasses two other significant anniversaries. This year also marks the 25th anniversary of the Juran Institute and the 50th anniversary of Juran's historic trip to Japan. Juran's trip came at the behest of Japanese leaders wishing to realize the benefits of quality management in their businesses. The visit's success marked a turning point in Japan's economic development.

The Juran Institute will celebrate all three milestones at an invitation-only tribute from at the Marriott Hotel in Stamford, Connecticut. Friends, family and associates who have benefited from Juran's work—including Robert Galvin, chairman emeritus of Motorola Corp.—will make brief presentations during the event, and Juran will offer closing remarks.

From:

Jim L. Smith

Arguably the greatest management and quality consultant of the 20th century, Dr. Juran is remembered as an evangelist for quality and quality management.

Near the anniversary of the death of Dr. Joseph M. Juran (1904–2008), I thought it might be of interest to revisit the person who has been called the father of quality and referred to as the greatest quality giant of the 20th century. Perhaps more importantly, he is recognized as the person who influenced the adding of the human dimension to quality, broadening it from its statistical origin to the more comprehensive total quality management.

Juran pushed for the education and training of managers. His thought was that human relations problems were most important to isolate and resolve. He felt that resistance to change was more of a cultural issue and the root cause of quality problems.

My personal exposure to Juran began with an article of his I read more than 35 years ago. As a young quality engineer, I was part of team charged with bringing to my company unique quality approaches. Juran consented to visit with our senior management to share his thoughts.

I was able to meet him on several occasions, but during our first meeting, I was already inspired to join the American Society for Quality and get involved in quality. Through a journey of studying and learning about quality from many people, I became a Juranite-a disciple of his theories and practioner of his principles of quality. He didn't just teach statistics. In fact, he didn't think of himself as a statistician but simply dedicated to the total quality approach. Through Juran's influence, it became evident that the human side of quality was just as important as the technical side.

Juran's life is like a Horatio Alger story. His humble start in life gave no indication to the success and notoriety he would achieve.

In 1924, he accepted a position in the inspection group at Western Electric in Hawthorne, IL, at a weekly salary of \$27. He rose to inspection division chief in just five years. During this time, he wrote the first known text on statistical quality control-and the ancestor of today's widely-used Western Electric Statistical Quality Control Handbook.

Little did he know at the time, the decision to work at Western Electric would set him off on a more than 75-plus year career in quality. He would work with a virtual who's who in quality. People such as George Edwards, Harold Dodge, Harry Romig and Walter Shewhart helped shape his ideas and his future.

During WWII, Juran served the Department of Defense as assistant administrator of the Lend-Lease program. After the war, he didn't go back to Western Electric but went forward to create history.

In 1946, he, along with several other notables, founded the American Society for Quality Control. Juran developed what arguably became the foremost influential course on quality. His "Managing for Quality" curriculum has been taught to thousands of people in almost every country of the world.

In 1954, he conducted seminars for Japan's senior and middle managers, explaining the roles they had to play in promoting quality. Juran was invited back many times and his teachings were so inspirational that a temple was named in his honor. He also was honored with Japan's highest award that can be given to a non-Japanese-the Order of the Sacred Treasure. It was awarded in recognition of his contribution to "the development of quality control in Japan and the facilitation of U.S. and Japanese friendship."

Juran's process of developing ideas was gradual. Top management involvement, the Pareto principle-which could easily have been named the Juran principle-the need for widespread quality training, the definition of quality, the Juran Trilogy, the project-by-project approach to improvement-these are some of the ideas for which he is best known and all emerged gradually. The first edition of his classic book, the Quality Control Handbook, first released in 1951, contained about 100 pages and the fifth edition more than 1,900 pages. The sixth edition has recently been released and he edited it even in the final days of his life. His handbook is still widely considered to be the bible on quality.

Juran's groundbreaking work in quality management and leadership was the catalyst that transformed industries. Shortly before his death, Juran said, "My job of contributing to the welfare of my fellow man is my great unfinished business."

From:

Kenneth E Case

JOSEPH M. JURAN, founder of the Juran Institute for Leadership in Quality and a pioneer, teacher, consultant, and guru of quality control, died on February 28, 2008, at the age of 103. He was elected a member of NAE in 1988 for "pioneering contributions in developing the practice of statistical quality control, and in developing engineering design principles base on statistical concepts."

Joseph Moses Juran was born on December 24, 1904, in Romania. Eight years later, the family immigrated to Minneapolis to escape poverty and the threat of violence against Jews. Joseph became a naturalized U.S. citizen in 1917 and served as a second lieutenant, eventually captain, in the U.S. Army Signal Corps Reserve performing cryptanalysis.

He went on to become the world-renowned elder statesman of quality control. His 75-year career included 17 years at Western Electric, four years on loan to the Lend Lease Administration beginning soon after the attack on Pearl Harbor, and more than 50 years as a management consultant. Joseph was not only a pioneer in the field of quality control field, but was also one of the most revered leaders in the field.

Joseph Juran was elected to the National Academy of Engineering in 1988. In 1992, he was awarded the National Medal of Technology by President George H. W. Bush "for his lifetime work of providing the key principles and methods by which enterprises manage the quality of their products and processes." Even earlier, in 1981, he was awarded the Order of the Sacred Treasure by the emperor of Japan. That same year, he received the Frank and Lillian Gilbreth Industrial Engineering Award, the highest honor given by the Institute of Industrial Engineers. He also received the Grant Medal (1967), Edwards Medal (1962), and Brumbaugh Award (1958) from the American Society for Quality Control, any one of which is considered the capstone of a career; Joseph went on to contribute for another 40 years.

By the time he was 20, Juran had held 16 jobs, including his first job selling the Minneapolis Tribune at a streetcar stop. When he wasn't working, he continued to pursue his formal education. His teachers kept moving him ahead to challenge him, and in 1920 he entered the University of Minnesota, where he received his B.S. in electrical engineering in 1924. College was a challenge, and maintaining a C average was sometimes a struggle, as he continued to work to make ends meet. In 1926, he joined

the inspection statistical department at Western Electric, one of the first such departments ever established.

In 1929, at the age of 24, Joseph was appointed chief of Western Electric's Quality Inspection Results Division, which oversaw five departments. In 1935, still working at Western Electric, Joseph earned a J.D. from Loyola University. Practicing law was his backup employment plan during the depression. In 1937, he moved to New York to become corporate industrial engineer at Western Electric/AT&T headquarters. About this time he also became active in the Society for the Advancement of Management, American Management Association, and American Society of Mechanical Engineers.

In 1941, while on a benchmarking visit to General Motors, he discovered the work of Vilfredo Pareto on the distribution of wealth (that relatively few people own the great majority of the wealth). He applied this principle to quality by showing conclusively that relatively few contributors (e.g., components) in a system—the vital few—account for the bulk of the effect (e.g., defects). He later discovered that this principle had been incorrectly attributed to Pareto, but more than 50 years later, when he was asked if the name should be changed to the "Juran principle," he said, "No, but perhaps after I go to the great beyond."

The same year, 1941, he was "loaned" by Western Electric to the Lend Lease Administration for six weeks, starting on Christmas Day. As World War II continued, the six weeks stretched into four years.

From 1945 to 1949, Joseph began his career as a consultant, assisting clients such as Gillette, BorgWarner, and Hamilton Watch Company. During this time he became a founding member of the American Society for Quality Control (ASQC). From 1949 to 1979, he had his own consultancy. Beginning with clients such as General Foods, Bausch and Lomb Optical, and International Latex., his client list quickly grew to include many North American and international organizations. From 1950 to 1991, he made 178 trips abroad to lecture, consult, teach courses, and attend quality conferences in 34 countries.

In 1979, Joseph incorporated the Juran Institute for the purpose of transferring his knowledge to a set of 16 videotapes, the "Juran on Quality Improvement" package, which included 50 workbooks, two leader's manuals, and three books. The Juran Institute eventually expanded to offer consulting services, workshops, papers, and additional books and tapes. In 1987, Joseph stepped down from his position as chairman and CEO of the institute to become chairman emeritus. From 1988 to 1991, Joseph was tapped to serve as a founding member of the U.S. Malcolm Baldrige National Quality Award Board of Overseers.

Joseph's writings number in the hundreds, many of them translated into 30 different languages. His books span nearly 60 years, beginning with *Bureaucracy: A Challenge to Better Management* in 1944 (probably still relevant today) and ending with his memoirs, *Architect of Quality*, published in 2003.

Juran's Quality Control Handbook, which has been published in many editions since it first appeared in 1951, is still considered the definitive compilation on quality. Quality Planning and Analysis, published in several editions since 1970, is used throughout the world by both practitioners and academics.

According to Joseph's son Donald, his father always told him, "Never be without a project." Speaking a few days after his father's death, Donald added, "And he never was." Joseph's contributions were motivated by his strong underlying beliefs developed over many years of helping people. A few of his sayings, captured by Hélio Gomes in Quality Quotes (ASQ Quality Press, 1996) are listed here:

On the cost of poor quality: "In the U.S.A., about a third of what we do consists of redoing work previously done."

On the definition of quality: "Quality is fitness for use."

On quality control: "For quality in the sense of freedom from deficiencies, the long-range goal is perfection."

On innovation: "Improvement means the organized creation of beneficial change; the attainment of unprecedented levels of performance. A synonym is 'breakthrough.'"

More on innovation: "To achieve improvement at a revolutionary pace requires that improvement be made mandatory—that it become a part of a regular job, written into the job description."

On standards/standardization: "Without a standard, there is no logical basis for making a decision or taking action."

On top management commitment: "Observing many companies in action, I am unable to point to a single instance in which stunning results were gotten without the active and personal leadership of the upper managers."

On total quality management (TQM) implementation: "The recipe for action should consist of 90% substance and 10% exhortation."

On TQM leaders and managers: "All managerial activity is directed at either breakthrough or control. Managers are busy doing both of these things, and nothing else."

More on TQM leaders and managers: "Had Deming (also an NAE member and National Medal of Technology recipient) and I never gone there, the Japanese quality revolution would have taken place without us ... the unsung heroes of the Japanese quality revolution were the Japanese managers."

Joseph's vision for this country was that the 21st century would be the "Century of Quality." In 1994, he had argued for a national center for the study of quality. In 1997, he realized this ambition when the Carlson School of Management at the University of

Minnesota established the Joseph M. Juran Center for Leadership in Quality. The center focuses on rigorous research, educating scholars, and the discovery, dissemination, and teaching of quality leadership in the United States and around the world.

In 2000, the American Society for Quality (ASQ) introduced the Juran Medal in Joseph's honor. The medal is awarded to individuals who "exhibit distinguished performance in a sustained role as an organizational leader, personally practicing the key principles of quality and demonstrating breakthrough management." In 2000 the recipient was Robert W. Galvin, and in 2003 the recipient was John A. Young, both NAE members.

Following Joseph's death, *Quality Progress*, the flagship publication of ASQ, invited readers to share their thoughts, some of which are listed below

"At a time when the field of quality was often contentious and our new Baldrige effort was still fragile, Dr. Juran was a steadying influence, bringing credibility and confidence to our work. His services and leadership within the first Board of Overseers were a key foundation for our early work, enhancing the award's stature in the U.S. and around the world."

—Curt Reimann, first director of the Baldrige National Quality Program.

"The last time I saw him was in the White House when the first Baldrige Awards were given, and his first words to me were, 'You should be proud of what you accomplished to bring this award about.' Typical graciousness by a great man. The world and I will miss him."—Jack Grayson, founder, American Productivity and Quality Center.

"I visited Juran late last year, arriving unexpectedly during lunchtime. 'If you had told me you were coming, we could have had lunch together. Now, you'll have to watch me eat mine.' He was obviously working hard, his desk covered with papers. It was the first time I had seen him in several years, and although he was slower afoot there was nothing, literally nothing, lacking in his mental agility. I departed amazed at the man's vitality. Rare events, wonderful rare events, do occur."—J. Stuart Hunter, NAE member, Professor Emeritus, Princeton University.

"Dr. Juran wrote that the purpose of the (Juran) Institute is to improve the quality of society. He said, 'Whatever you do, make sure it improves society. Don't just do it for the sake of profit.'"—Joseph A. DeFeo, president and CEO, the Juran Institute

"Dr. Juran changed many lives. He did so through his books, videos, recordings, papers, and public addresses. He did so by simply striking up a conversation with a stranger at a conference. He changed lives by setting an extraordinary example. Through his deeds. His generosity. His wisdom. His unselfish focus on humanity. And his unrelenting goal to pay back a debt to society for the opportunities presented to him over the years. Everything he said or did represent the kind of human qualities we would all like to emulate."—Howland Blackiston, Juran's grandson-in-law and producer of the documentary, "An Immigrant's Gift."

"Heaven will get better."—Joaquim Donizetti Donda, an ASQ member.

Married for 81 years, Joseph is survived by his wife Sadie, four children, and many grandchildren and great-grandchildren.

Note: The author appreciates the generosity of ASQ, especially Mark Edmund, for permission to use material from "The Architect of Quality: Joseph M. Juran 1904–2008," Quality Progress, April 2008.

His son, Charles wrote:

I want to tell you about my Dad but it isn't easy to find the words while emotions are still ragged and raw. How do you look at a life and explain what it meant? Most brave things are done in private and there is no medal for being faithful or meeting one's responsibilities. Eulogies at least give us a chance to honor these things.

His amazing journey began when Theodore Roosevelt was in the White House and Hitler, a failed art student. He persevered through grinding poverty in the early days, endless wars, a frightening depression, family problems, and a complete lack of social skills resulting from the upbringing he had.

Later in life things mellowed for him and the accolades came, although he never sought them. His touchstone, from Kipling, was to meet triumph and disaster on equal terms. He doted on his grandchildren and great-grandchildren. In this, we were able to give something back. I treasure what he inscribed to us in one of his books: "To the Redlands Jurans: you have so sweetened these years."

I inherited his flair for technical things and we had a wonderful relationship but his greatest gift to me was not the genes (although that was major), it was a moral compass I struggled vainly to emulate: knowledge, humility, a stern work ethic, honor, absolute honesty, justice, and love of his family and country.

The Last of their Kind

They are all gone now, the last survivors of that little band of immigrant kids who sailed to America in 1912. These three, unlike today's immigrants, were tossed cold turkey into an English-speaking school, to sink or swim. They chose to swim.

Out of that little shack in Minneapolis came three who had a huge influence on my life: Aunt Min, who had to go to an orphanage when her mother died, overcame her upbringing, put her ambitions on hold until her family was raised, and finally went to college, all the way to Ph.D. status. And Uncle Nat, who never bore a grudge about his poverty years, studied architecture at MIT, switched to the movie business, and became an Oscar winning director.

And my Dad, overcoming the demons from a bitter childhood to achieve worldwide prominence in his chosen field of managing for quality. Only in America! And although this is still the land of opportunity, I don't think we'll see their like again.

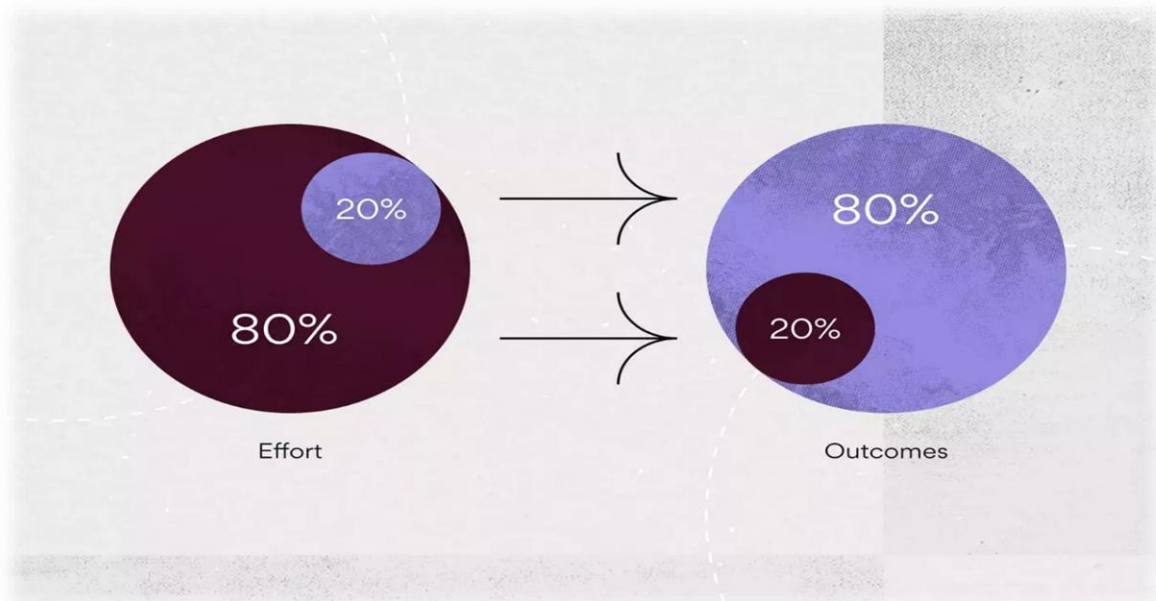
Pareto Principle

The Pareto Principle (also known as the 80/20 rule) is a phenomenon that states that roughly 80% of outcomes come from 20% of causes.

In other words, a small percentage of causes have an outsized effect. This concept is important to understand because it can help you identify which initiatives to prioritize so you can make the most impact.

[Kindly visit this Web Page](#)

<https://www.youtube.com/watch?v=c41-6GAHg1Q>



Where does the Pareto principle come from?

The Pareto principle was developed by Italian economist Vilfredo Pareto in 1896. Pareto observed that 80% of the land in Italy was owned by only 20% of the population. He also witnessed this happening with plants in his garden—20% of his plants were bearing 80% of the fruit. This relationship is best mathematically

described as a power law distribution between two quantities, in which a change in one quantity results in a relevant change into the other.

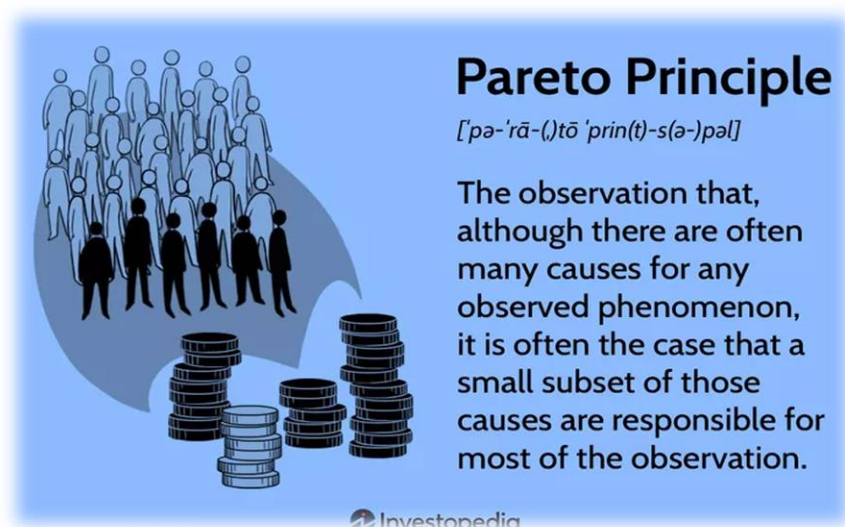
This phenomenon also goes by a couple of different names:

- ❖ Pareto principle
- ❖ The 80/20 rule (most common)
- ❖ Law of the vital few
- ❖ Principle of factor sparsity

The 80/20 rule is not a formal mathematical equation, but more a generalized phenomenon that can be observed in economics, business, time management, and even sports.

Steps to identify the important causes using 80/20 rule:

- Form a frequency of occurrences as a percentage
- Arrange the rows in decreasing order of importance of the causes (i.e., the most important cause first)
- Add a cumulative percentage column to the table, then plot the information
- Plot (#1) a curve with causes on x- and cumulative percentage on y-axis
- Plot (#2) a bar graph with causes on x- and percent frequency on y-axis
- Draw a horizontal dotted line at 80% from the y-axis to intersect the curve. Then draw a vertical dotted line from the point of intersection to the x-axis. The vertical dotted line separates the important causes (on the left) and trivial causes (on the right)
- Explicitly review the chart to ensure that causes for at least 80% of the problems are captured



Understanding the Pareto Principle

The principle was developed by Italian economist Vilfredo Pareto in 1906 and was dubbed the Pareto Principle by Joseph M. Juran in the 1940s. Pareto observed that the majority of the wealth (80%) was owned by a minority (20%) of the people. According to what Pareto observed, 80% of the land in Italy was owned by 20% of the population. After surveying other countries, he found the same applied abroad. For the most part, the Pareto Principle is an observation that things in life are not always distributed evenly.

The Pareto Principle can be applied in a wide range of areas such as manufacturing, management, and human resources. It suggests that the efforts of 20% of a corporation's staff could drive 80% of the firm's profits. The Pareto Principle is even more applicable to businesses that are client-service based. It has been adopted by a variety of coaching and customer relationship management (CRM) software programs.

It can also be applied on a personal level. Time management is the most common use of the Pareto Principle. That's because most people tend to thinly spread out their time instead of focusing on the most important tasks. In terms of personal time management, 80% of your work-related output could come from only 20% of your time at work.



Advantages and Disadvantages of the Pareto Principle

Advantages

There is a practical reason for applying the Pareto Principle. Simply, it can give you a window into who to reward or what to fix. For example, if 20% of the design flaws in a car are leading to 80% of the crashes, you can identify and fix those flaws.

Similarly, if 20% of your customers drive 80% of your sales, you may want to focus on those customers and reward them for their loyalty. In this sense, the Pareto Principle becomes a guide for how to allocate resources efficiently.

Disadvantages

While the 80/20 split is true for Pareto's observation, that doesn't necessarily mean that it is always true. That's because it is based on anecdotal evidence rather than scientific analysis. For instance, 30% of the workforce (or 30 out of 100 workers) may only complete 60% of the output. The remaining workers may not be as productive or may just be slacking off on the job. This further reiterates that the Pareto Principle is merely an observation and not necessarily a law.

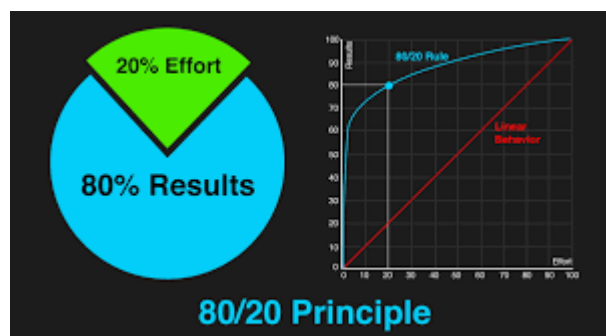
The principle has also led to advisors focusing on replicating the top 20% of their clients, knowing that adding a client of that size immediately affects the bottom line.

Pros

- Pinpoints who to reward and what to fix
- Provides a guide on how to allocate resources

Cons

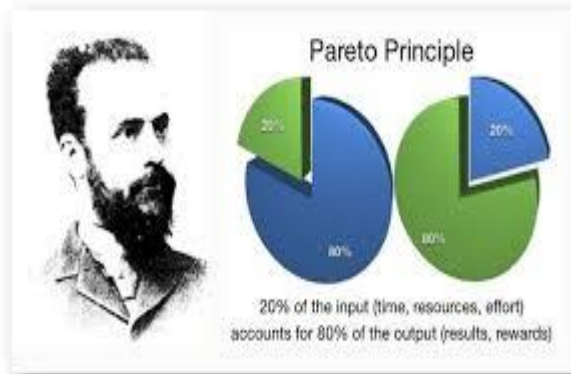
- May not always be accurate as it is derived on anecdotal evidence rather than scientific analysis
- May lead advisors to replicate the top 20% of their clients



How one can use the 80/20 rule

While the 80/20 rule applies to almost every industry, the Pareto principle is commonly used in business and economics. This is because the 80/20 rule is helpful in determining where you can focus your efforts to maximize your output.

The basis of the Pareto principle states that 80% of results come from 20% of actions. If you have any kind of work that can be segmented into smaller portions, the Pareto principle can help you identify what part of that work is the most influential.



Here are a few examples of how to use the tool in practice.

Productivity

- You can use the 80/20 rule to prioritize the tasks that you need to get done during the day.
- The idea is that out of your entire task list, completing 20% of those tasks will result in 80% of the impact you can create for that day. So, in order to get the most impact done, identify which tasks have the most impact for your team and focus on those for the day.
- To do this, list out all of the things that you need to get done that day. Then identify which of those tasks have the highest impact. Do any of your tasks involve collaborating with other teammates? Are there any tasks on your plate that are blocking projects from moving forward? These tasks may be simple in execution, but they can make a large impact to the rest of the team by allowing the process to keep flowing.

Decision Making

The Pareto principle can help you to make the best decisions during the problem-solving process. When there are many different causes to one problem, the Pareto principle can help you prioritize solutions. Here are a few steps to how this works:

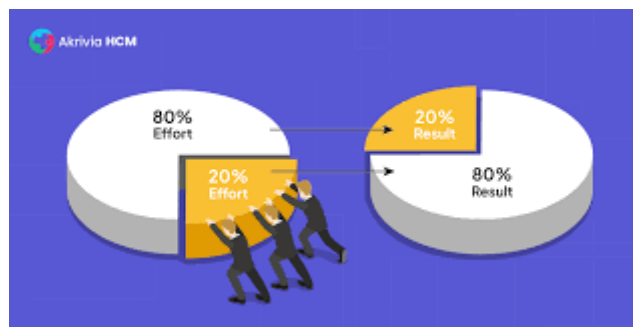
1. Identify the problems that your team is experiencing. These are the problems that you're trying to find a solution to within this decision-making process.
2. Identify the causes of these problems. Using a tool like the 5 Whys process, find all of the causes of the problems you're trying to solve.
3. Categorize your problems into similar groups. If some of the causes of the problems you're trying to solve can fall into similar categories, use this as an opportunity to group them together. This can help you decide if one solution can resolve multiple issues.

4. Assign a value to each of these problems based on the impact to the business. The value can be as simple as a number between 1-10, or actual monetary value to indicate the importance.
5. Develop a plan to focus on the top 20% of the problems that impact the business. The idea is that one solution can resolve multiple problems. Based on the values you assigned to each problem, calculate which ones are in the top 20%. Once you've identified the main problem, develop a plan to create a solution that can result in 80% of the results using problem-solving strategies.

Avoiding the Pitfalls of the Pareto Principle

Like all principles, the Pareto Principle has a few drawbacks:

- It's important to remember that the 80/20 Rule is not about reducing your workload. Instead, the Pareto Principle helps you identify the most critical, high-impact tasks on your to-do list. Don't neglect the small tasks, unimportant tasks, though. Eventually, those small tasks will become important if you let them sit too long.
- The 80/20 Rule might help you identify which of your employees are producing the most work if you're managing a team. Looking at the 20% of employees that complete 80% of the work doesn't necessarily mean you should fire everyone else. Instead, use the findings of the Pareto Rule to delegate tasks to your team fairly.
- Encourage your team to collaborate on high-priority tasks. Or assign different jobs to different people and check in with everyone to ensure they feel responsible for their part of the equation. Your employees will be encouraged to work harder if they know they're contributing to the biggest piece of the rewards—not just the minor details.



Examples

Time management

Time management is the most common use of the Pareto Principle. Many people tend to thinly spread out their time instead of focusing on the most important task.

Likewise, there is the idea that people must work excessively long hours to produce good outcomes. This type of thinking can create an unequal work-life balance, resulting in burnout and overall decreased productivity.

With the Pareto Principle, you can save time on work tasks and get more done in a shorter span of time.

For instance, you could spend some time at the start of the week planning out what you are going to focus on during the workdays, usually the most important tasks.

While this may feel like a waste of time, in the long run it can help you to focus and cut down work time.

You may find that you have more time to devote to other activities outside of work such as personal development, relaxation, mental health, and building relationships.

Relationships

With relationships, many people may want to have as many friends as possible, but they find they become overwhelmed with trying to maintain these relationships or find they don't have high quality friendships with anyone.

Using the Pareto Principle, you can look at the friends you have and work out how much time you spend with each of them compared to the amount of value they give you.

Through this analysis, determine which 20% of your relationships are valuable and supportive of you. According to the Pareto Principle, if you spend 80% of your time socializing with this 20%, your personal gains will be greater.

In a relationship with a partner, it may be helpful to consider that 80% of the problems faced in the relationship are likely caused by 20% of the couple's actions or behaviors.

The Pareto Principle can be used to identify the root causes of your conflicts with your partner, communicate about them, and focus on improving them together.

Goal setting

Often, people have never-ending to-do lists or they end up doing the least important tasks on their lists first, then find they are not motivated to complete the more important tasks.

A way to use the Pareto Principle is to write down all your goals you want to complete on a given day. Ask yourself, if you could only accomplish one of the goals on that list today, which one would have the greatest positive impact on your life?

It may be helpful to think of the consequences that can come as a result of not completing that task today. Next, pick the second most important goal, and so on.

What you will find is that you will have determined the most important 20% of your goals that will help you the most. You can then ensure you focus on completing this 20% before moving onto any other goals.

Problem-solving

The Pareto Principle can be used to help you make the best decision in problem-solving circumstances.

To help to prioritize solutions, you can follow the below steps:

1. Identify the problems that you are trying to find a solution to.
2. Identify what the causes of these problems are.
3. Categorize your problems into similar groups based on which ones have similar root causes. This can help you decide if one solution can resolve multiple problems.
4. Assign a value to each of the problems based on their impact if they were or were not resolved. You could rate them between 1-10 if this helps.
5. Develop a plan to focus on the top 20% of the problems that will result in 80% of the results.

Social Interactions

The Pareto Principle can also be seen in everyday situations, such as work meetings; imagine that a work meeting has 10 attendees.

It is likely that only a few people will do most of the talking, while the rest will listen or say very little.

In this case, the 80:20 rule applies, with 80% of the talking being done by 20% of the people in the room.

Similarly, this principle can also be applied to decision-making.

In any group decision-making situation, it is often true that 80% of the decisions are made by 20% of the people involved.

This is because some people are naturally more vocal and opinionated than others, and their opinions tend to hold more sway.

Education

The Pareto Principle is often used as a way to help students focus on their studying.

The idea is that if a student can identify the 20% of material that will be on the test, they can focus their studying on that 20% and still get a good grade.

This principle can be applied in a number of ways. For example, a student might look at their past tests and quizzes to see which topics were covered most often.

They could also ask their teacher or classmates what they think will be on the upcoming test. Once the student has a list of topics, they can start to focus their studying on those areas.

The Pareto Principle can also be applied to individual questions on a test.

For example, if a multiple-choice question has four possible answers, it might be worth spending more time studying that question if you have identified that one of the answers is correct 80% of the time.

Overall, the key to implementing the Pareto Principle successfully involves taking an analytical approach and focusing on those topics or questions that are most likely to matter.

This can help students study more efficiently and improve their performance as a result.

The effectiveness of this principle has been widely studied, and there is some evidence that it can be quite effective in helping students prepare for tests.

For example, a 2014 study found that when students used a computer program based on the Pareto Principle to choose which material they would study, they performed better on a test compared to students who did not use the program.

Given these results, it seems likely that the Pareto Principle can help students improve their performance in school by helping them focus their studying on key areas of the curriculum.

By identifying and understanding the material that is most important to learn, students can spend less time reviewing concepts they already know and more time on those that need improvement (Dunnford, Su, & Tamang, 2014).

Income Inequality

Pareto's initial 1906 observation that 80% of Italy's land was controlled by 20% of people mirrors today's estimate that 20% of the world's population controls 82.7% of wealth.

This phenomenon, known as income inequality, is a major concern for policy makers and social scientists around the world.

One potential explanation for this disparity is that the wealthy 20% are better able to take advantage of opportunities and resources than their less fortunate counterparts.

For example, they may have greater access to education or better job prospects due to family connections or networks of influence.

In addition, those in the top quintile may be more likely to engage in tax avoidance strategies and other financial maneuvers that help them accrue even more wealth (Bommier & Zuber, 2012).

Another possible factor influencing income inequality is structural changes in the economy over time.

For example, technological advances such as automation and artificial intelligence have led to an increased demand for highly-skilled workers who can operate these new technologies, while displacing low-skilled workers who are unable to keep up with the pace of change.

As a result, those with higher education levels and skills tend to enjoy higher wages and greater economic stability than those without.

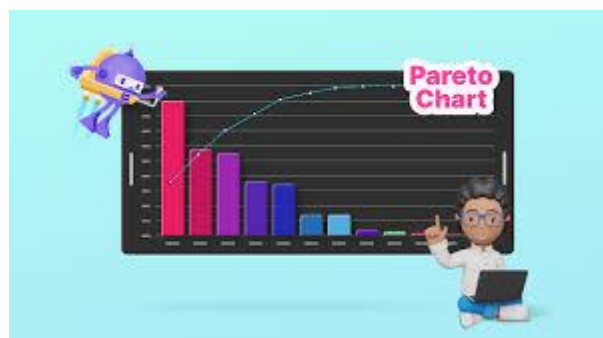
As this gap widens, those in the top quintile accumulate a greater and greater percentage of the world's net wealth (Bommier & Zuber, 2012).



WORK LESS ACHIEVE MORE
80-20 PRINCIPLE



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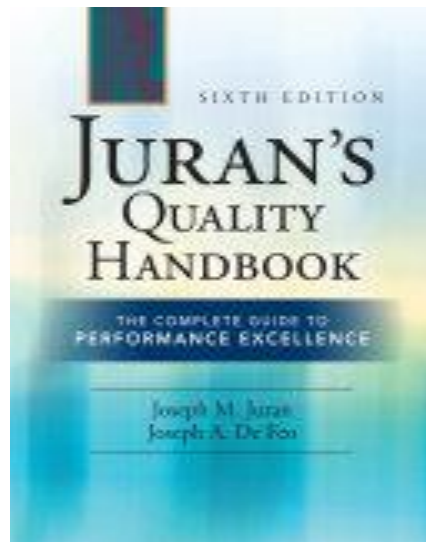
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- 03] https://en.wikipedia.org/wiki/Pareto_principle
- 04] <https://www.forbes.com/sites/kevinkruse/2016/03/07/80-20-rule/>
- 05] <https://www.briantracy.com/blog/personal-success/how-to-use-the-80-20-rule-pareto-principle/>
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Joseph M Juran



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Description

A thorough revision of the bestselling handbook that has defined quality management and operational excellence for more than 50 years!

This compendium of knowledge for the science of quality control and management has been updated to meet the needs of today's business and quality professionals. Featuring the latest methods, research, and tools, this authoritative resource shows how to apply universal methods for delivering superior results and excellence in any organization, industry, country, or process.

For more than 50 years, Juran's Quality Handbook has been the singular essential reference to quality management and engineering. The Sixth Edition—the first revision of the Handbook in 10 years—forges a new standard in tools for quality. Bringing leaders, managers, master and black belts, and engineers the most up-to-date

methods, research, and tools, under the guidance of a team of the world's top experts, this authoritative resource shows how to apply universal methods for delivering superior results and organizational excellence in any organization, industry, country, or process.

Joseph A. De Feo is a leading quality management practitioner and successor to Dr. Juran as Chairman and CEO of Juran Global, Inc. He is recognized worldwide for his expertise in enabling organizations to achieve organizational excellence.

Joseph M. Juran was the international thought leader in the quality management field for more than 70 years and continues to be considered the father of modern-day quality management. He helped to create the U.S. Malcolm Baldrige National Quality Award and was the founder of Juran Institute, Inc. and author of more than 20 books.

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New in the Seventh Edition

The seventh edition—a major revision—forged a new standard in tools for performance excellence not just quality management. The Quality Handbook has been completely updated to meet the ever-changing needs of today's business and quality professionals.

Under the guidance of Dr. Joseph A DeFeo and a team of global experts, this authoritative resource demonstrates how to apply the right methods for delivering superior results and achieving excellence in any organization, industry, or country.

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- Updated chapters on Lean, Six Sigma and the Shingo Prize
- NEW chapters on Risk Management and Building a Quality Management System
- NEW material on the history of quality management
- All ISO and other regulatory standards have been updated
- NEW statistical tables, charts, and data
- Examples and case studies throughout demonstrate how others have applied the methods and tools discussed in real-world situations

ABOUT THE AUTHOR



- **Dr. Joseph A. DeFeo**

Dr. Joseph A. DeFeo is a leading business management consultant, quality management practitioner and successor to Dr. Juran as president of Juran Institute, Inc. He is recognized worldwide for his expertise in enabling organizations to achieve business excellence. Dr. DeFeo's varied areas of expertise include coaching executives to understand key factors in driving organization-wide change programs and deploying breakthrough management principles like Lean, Six Sigma, strategic planning, and business process improvement.

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Highlights from Juran on Quality Leadership

<https://www.youtube.com/watch?v=LJ2Hj4RiPiM>

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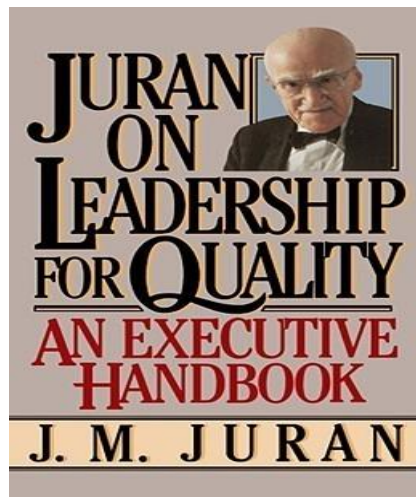
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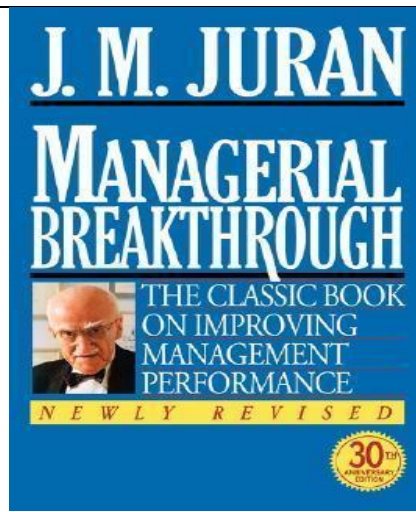
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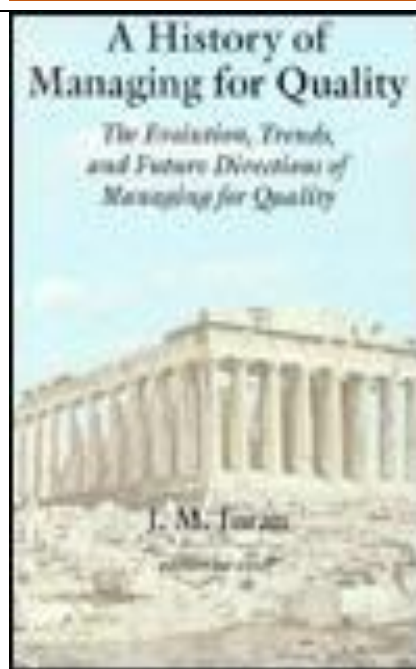
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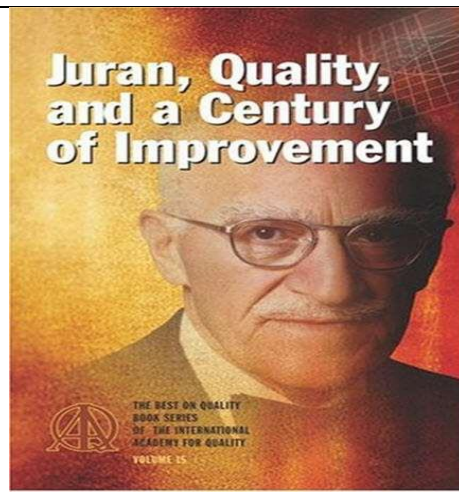
The subject of management for quality has undergone rapid and drastic change as a result of competition in the marketplace and the vulnerability of industrialized societies that depend heavily on the quality of goods and services. In this companion volume to his acclaimed Juran on Planning for Quality, J.M. Juran provides top-level managers with the specific, field-tested methods they need to successfully lead their companies on the quest for superior quality.



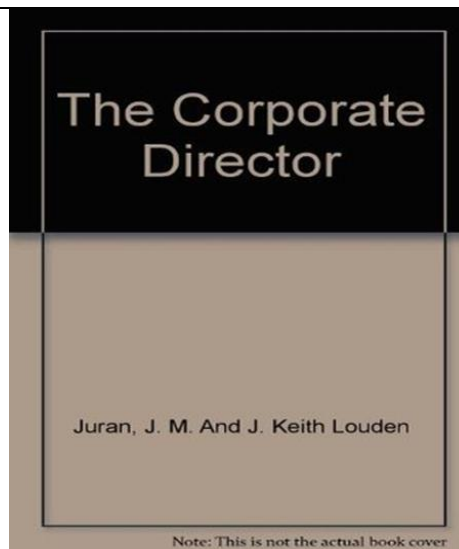
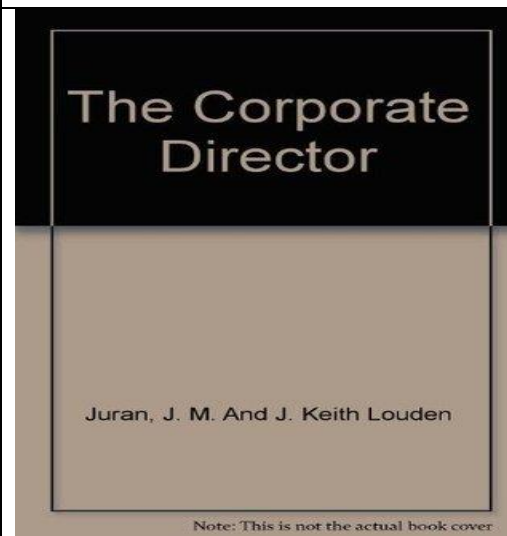
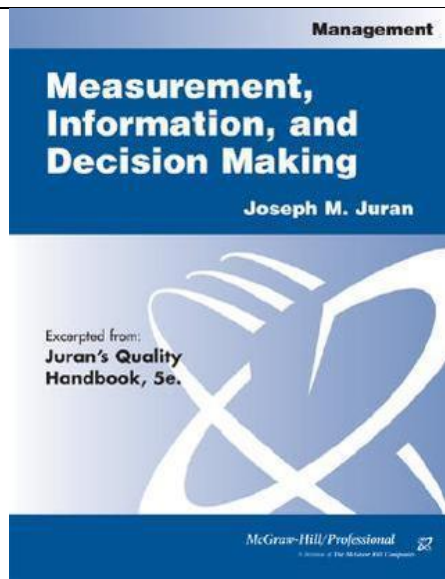
In this 30th anniversary edition of a management classic, Dr. Joseph Juran builds on his sound and orderly approach to effective management. Incorporates new material on planning and other recently evolved issues, and expands on Juran's pioneering views of reengineering.



Engineer, manager, executive, author and lecturer, Dr. Joseph M. Juran compiles the first-ever international history on managing for quality. Focusing on the elements of quality management common to all industries, this volume illustrates the immense effect that quality, and its evolution, has had on civilization over the centuries. Juran brings together a richly diverse group of authors, each one a renowned authority in the field of quality management. Each of the 17 stand-alone chapters describes how managing for quality evolved in a specific geographical area and during a specific time frame of human history. Juran summarizes this historical profile with a final chapter that identifies and traces worldwide trends, derives lessons learned over history, and suggests likely directions in managing for quality for the next century.



The fifteenth edition of this influential book series is a tribute to the person and works of Dr. Joseph M. Juran. For over three-quarters of a century the quality discipline has been blessed by the person and dynamics of Dr. Juran. His philosophies and contributions to the quality disciplines, his longevity as a contributor, and his vision in managing for quality, have had significant influences on the world of quality. Among the world renowned contributors (and International Academy for Quality members) to this volume include: Frank M. Gryna, A. Blanton Godfrey, Yoshio Kondo, Joe DeFeo, and Greg Watson



This text covers such topics as: company-wide assessment of quality; quality improvement and cost reduction; quality planning and sales income; control of quality; developing a quality culture; designing for quality; supplier relations; and marketing, field performance and customer service.

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QUOTES

- On the cost of poor quality:

“In the U.S.A., about a third of what we do consists of redoing work previously done.”

- On the definition of quality:

“Quality is fitness for use.”

- On quality control:

“For quality in the sense of freedom from deficiencies, the long-range goal is perfection.”

- On innovation:

“Improvement means the organized creation of beneficial change; the attainment of unprecedented levels of performance. A synonym is 'breakthrough.'”

- More on innovation:

“To achieve improvement at a revolutionary pace requires that improvement be made mandatory—that it become a part of a regular job, written into the job description.”

- On standards/standardization:

“Without a standard, there is no logical basis for making a decision or taking action.”

• On top management commitment:

“Observing many companies in action, I am unable to point to a single instance in which stunning results were gotten without the active and personal leadership of the upper managers.”

• On total quality management (TQM) implementation:

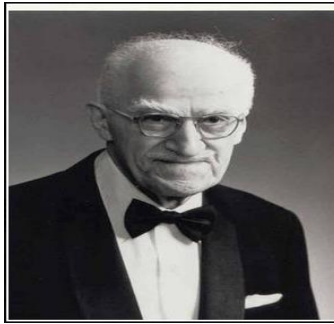
“The recipe for action should consist of 90% substance and 10% exhortation.”

• On TQM leaders and managers:

“All managerial activity is directed at either breakthrough or control. Managers are busy doing both of these things, and nothing else.”

• More on TQM leaders and managers:

“Had Deming (also an NAE member and National Medal of Technology recipient) and I never gone there, the Japanese quality revolution would have taken place without us . . . the unsung heroes of the Japanese quality revolution were the Japanese managers.”



Quality planning consists of developing the products and processes required to meet customer's needs

— Joseph M. Juran —

AZ QUOTES

It is most important that top management be quality-minded. In the absence of sincere manifestation of interest at the top, little will happen below.

Intrinsic is the belief that quality does not happen by accident, it must be planned!

Every successful quality revolution has included the participation of upper management. We know of no exceptions.

A good rule in organizational analysis is that no meeting of the minds is really reached until we talk of specific actions or decisions.

For many phenomena, 80% of consequences stem from 20% of the causes.

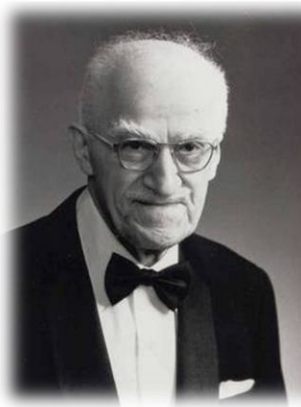
All improvement happens project by project and in no other way.

Goal setting has traditionally been based on past performance. This practice has tended to perpetuate the sins of the past.

Without a standard there is no logical basis for making a decision or taking action.

Quality planning consists of developing the products and processes required to meet customer's needs.

What I want to do has no end, since I am on the endless frontier of a branch of knowledge.

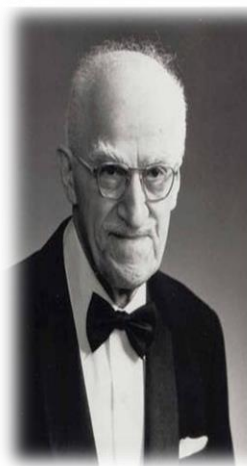


Goal setting has traditionally been based on past performance. This practice has tended to perpetuate the sins of the past.

— Joseph M. Juran —

AZ QUOTES

A good rule in organizational analysis is that no meeting of the minds is really reached until we talk of specific actions or decisions. We can talk of who is responsible for budgets, or inventory, or quality, but little is settled. It is only when we get down to the action words-measure, compute, prepare, check, endorse, recommend, approve-that we can make clear who is to do what.



Observing many companies in action, I am unable to point to a single instance in which stunning results were gotten without the active and personal leadership of the upper managers.

— Joseph M. Juran —

AZ QUOTES

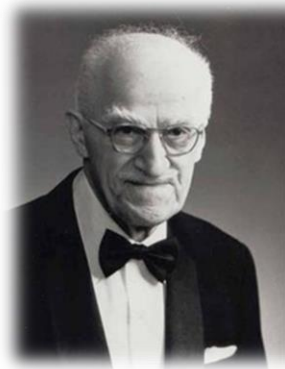
"It is most important that top management be quality-minded. In the absence of sincere manifestation of interest at the top, little will happen below." (Joseph M Juran, "Management of Inspection and Quality Control", 1945)

"Quality planning consists of developing the products and processes required to meet customer's needs." (Joseph M Juran, "Juran on planning for quality", 1988)

"Data are of high quality if they are fit for their intended use in operations, decision-making, and planning." (Joseph M Juran, 1964)

"Without a standard there is no logical basis for making a decision or taking action." (Joseph M Juran, "Managerial Breakthrough: The Classic Book on Improving Management Performance", 1995)

"'Benchmarking' is a recent label for the concept of setting goals based on knowing what has been achieved by others. A common goal is the requirement that the reliability of a new product be at least equal to that of the product it replaces and at least equal to that of the most reliable competing product. Implicit in the use of benchmarking is the concept that the resulting goals are attainable because they have already been attained by others." (Joseph M Juran, "The quality planning process", 1999)



Pareto's Principle: you generally spend 80% of your time on 20% of the project.

— Joseph M. Juran —

AZ QUOTES

*"Customer satisfaction comes from those features which induce customers to buy the product. Dissatisfaction has its origin in deficiencies and is why customers complain."
(Joseph M Juran, "How to think about quality", 1999)*

"Many quality failures arise because a customer uses the product in a manner different from that intended by the supplier." (Joseph M Juran, "The quality planning process", 1999)

"Quality goals that affect product saleability should be based primarily on meeting or exceeding market quality. Because the market and the competition undoubtedly will be changing while the quality planning project is under way, goals should be set so as to meet or beat the competition estimated to be prevailing when the project is completed." (Joseph M Juran, "The quality planning process", 1999)

"'Quality' means freedom from deficiencies - freedom from errors that require doing work over again (rework) or that result in field failures, customer dissatisfaction, customer claims, and so on." (Joseph M Juran, "How to think about quality", 1999)

"'Quality' means those features of products which meet customer needs and thereby provide customer satisfaction." (Joseph M Juran, "How to think about quality", 1999)

"Quality planning generates a large amount of information that is both useful and necessary, but without a systematic way to approach the organization and analysis of this information, the planning team may be overwhelmed by the volume and miss the message it contains." (Joseph M Juran, "The quality planning process", 1999)

"Goal setting has traditionally been based on past performance. This practice has tended to perpetuate the sins of the past."
(Joseph M Juran)



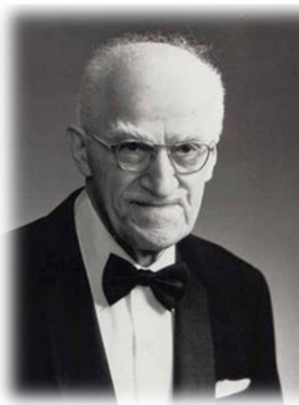
...every successful quality revolution
has included the participation of
upper management. We know of no
exceptions.

— Joseph M. Juran —

AZ QUOTES

"The anatomy of 'quality assurance' is very similar to that of quality control. Each evaluates actual quality. Each compares actual quality with the quality goal. Each stimulates corrective action as needed. What differs is the prime purpose to be served. Under quality control, the prime purpose is to serve those who are directly responsible for conducting operations - to help them regulate current operations. Under quality assurance, the prime purpose is to serve those who are not directly responsible for conducting operations but who have a need to know - to be informed as to the state of affairs and, hopefully, to be assured that all is well." (Joseph M Juran, "How to think about quality", 1999)

"To attain quality, it is well to begin by establishing the 'vision' for the organization, along with policies and goals. Conversion of goals into results (making quality happen) is then done through managerial processes - sequences of activities that produce the intended results." (Joseph M Juran, "How to think about quality", 1999)



What I want to do has no end, since I
am on the endless frontier of a
branch of knowledge.

— Joseph M. Juran —

AZ QUOTES

"When designing a product, there are actually two related but distinct aspects of what is being developed: the technology elements of what the product's features will actually do or how it will function and the human elements of the benefits customers will receive from using the product. The two must be considered together." (Joseph M Juran, "The quality planning process", 1999)

"Improvement means the organized creation of beneficial change; the attainment of unprecedented levels of performance. A synonym is 'breakthrough.'" (Joseph M Juran)

"Quality improvement should be directed at all areas that influence company performance - business processes as well as factory processes. Quality improvement should not be left solely to voluntary initiatives; it should be built into the system." (Joseph M Juran)

"To achieve improvement at a revolutionary pace requires that improvement be made mandatory - that it become a part of a regular job, written into the job description." (Joseph M Juran)



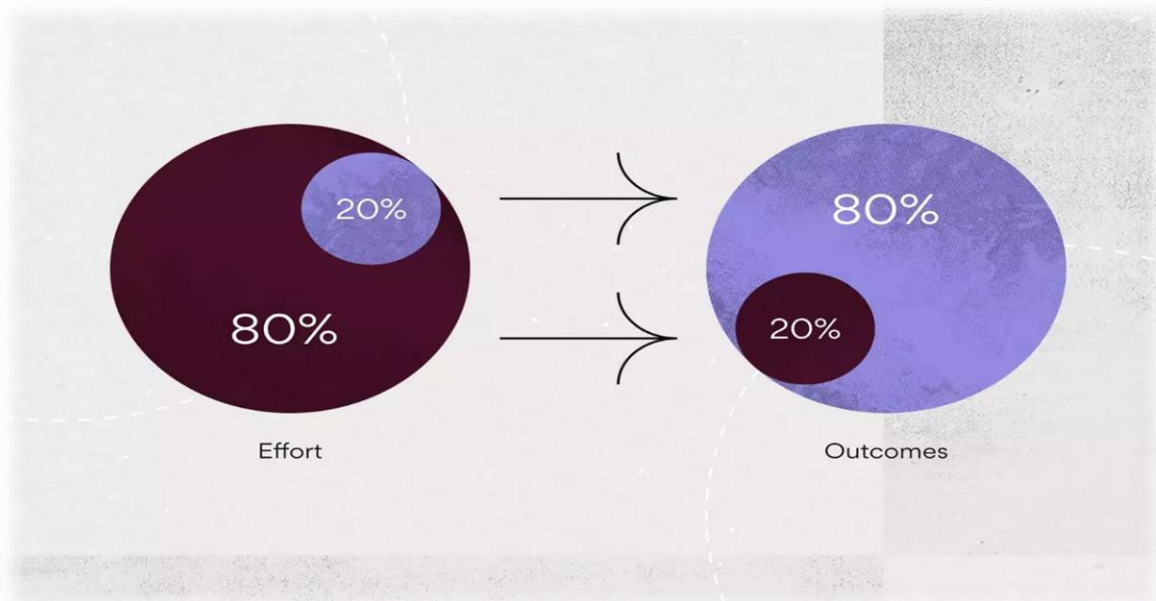
Pareto Principle

The Pareto Principle (also known as the 80/20 rule) is a phenomenon that states that roughly 80% of outcomes come from 20% of causes.

In other words, a small percentage of causes have an outsized effect. This concept is important to understand because it can help you identify which initiatives to prioritize so you can make the most impact.

[Kindly visit this Web Page](#)

<https://www.youtube.com/watch?v=c41-6GAHg1Q>



Where does the Pareto principle come from?

The Pareto principle was developed by Italian economist Vilfredo Pareto in 1896. Pareto observed that 80% of the land in Italy was owned by only 20% of the population. He also witnessed this happening with plants in his garden—20% of his plants were bearing 80% of the fruit. This relationship is best mathematically

described as a power law distribution between two quantities, in which a change in one quantity results in a relevant change into the other.

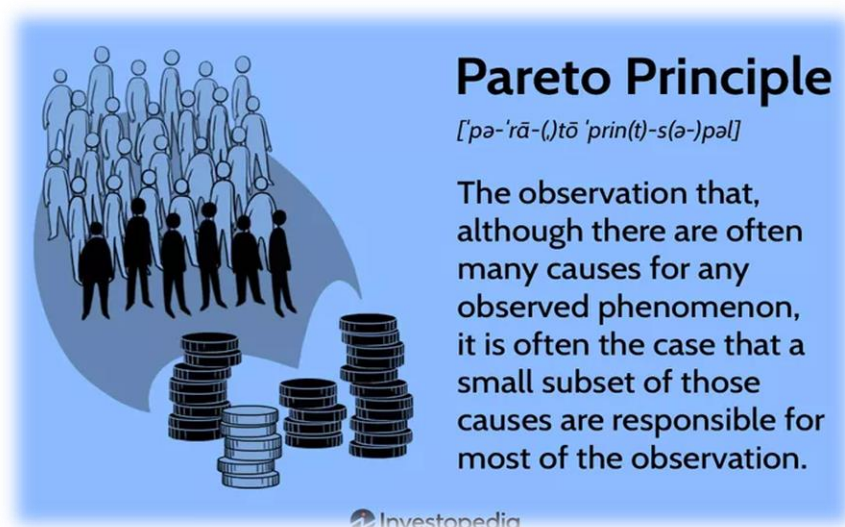
This phenomenon also goes by a couple of different names:

- ❖ Pareto principle
- ❖ The 80/20 rule (most common)
- ❖ Law of the vital few
- ❖ Principle of factor sparsity

The 80/20 rule is not a formal mathematical equation, but more a generalized phenomenon that can be observed in economics, business, time management, and even sports.

Steps to identify the important causes using 80/20 rule:

- Form a frequency of occurrences as a percentage
- Arrange the rows in decreasing order of importance of the causes (i.e., the most important cause first)
- Add a cumulative percentage column to the table, then plot the information
- Plot (#1) a curve with causes on x- and cumulative percentage on y-axis
- Plot (#2) a bar graph with causes on x- and percent frequency on y-axis
- Draw a horizontal dotted line at 80% from the y-axis to intersect the curve. Then draw a vertical dotted line from the point of intersection to the x-axis. The vertical dotted line separates the important causes (on the left) and trivial causes (on the right)
- Explicitly review the chart to ensure that causes for at least 80% of the problems are captured



Understanding the Pareto Principle

The principle was developed by Italian economist Vilfredo Pareto in 1906 and was dubbed the Pareto Principle by Joseph M. Juran in the 1940s. Pareto observed that the majority of the wealth (80%) was owned by a minority (20%) of the people. According to what Pareto observed, 80% of the land in Italy was owned by 20% of the population. After surveying other countries, he found the same applied abroad. For the most part, the Pareto Principle is an observation that things in life are not always distributed evenly.

The Pareto Principle can be applied in a wide range of areas such as manufacturing, management, and human resources. It suggests that the efforts of 20% of a corporation's staff could drive 80% of the firm's profits. The Pareto Principle is even more applicable to businesses that are client-service based. It has been adopted by a variety of coaching and customer relationship management (CRM) software programs.

It can also be applied on a personal level. Time management is the most common use of the Pareto Principle. That's because most people tend to thinly spread out their time instead of focusing on the most important tasks. In terms of personal time management, 80% of your work-related output could come from only 20% of your time at work.



Advantages and Disadvantages of the Pareto Principle

Advantages

There is a practical reason for applying the Pareto Principle. Simply, it can give you a window into who to reward or what to fix. For example, if 20% of the design flaws in a car are leading to 80% of the crashes, you can identify and fix those flaws.

Similarly, if 20% of your customers drive 80% of your sales, you may want to focus on those customers and reward them for their loyalty. In this sense, the Pareto Principle becomes a guide for how to allocate resources efficiently.

Disadvantages

While the 80/20 split is true for Pareto's observation, that doesn't necessarily mean that it is always true. That's because it is based on anecdotal evidence rather than scientific analysis. For instance, 30% of the workforce (or 30 out of 100 workers) may only complete 60% of the output. The remaining workers may not be as productive or may just be slacking off on the job. This further reiterates that the Pareto Principle is merely an observation and not necessarily a law.

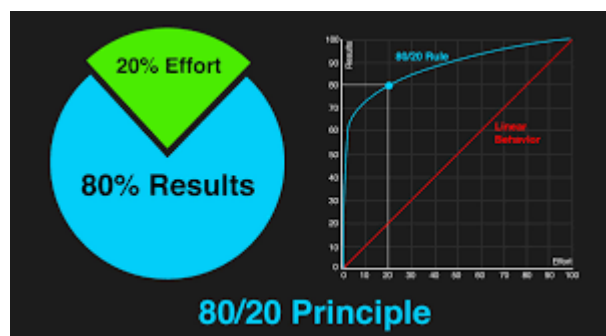
The principle has also led to advisors focusing on replicating the top 20% of their clients, knowing that adding a client of that size immediately affects the bottom line.

Pros

- Pinpoints who to reward and what to fix
- Provides a guide on how to allocate resources

Cons

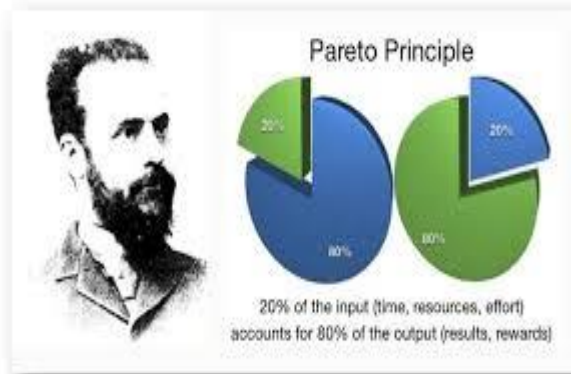
- May not always be accurate as it is derived on anecdotal evidence rather than scientific analysis
- May lead advisors to replicate the top 20% of their clients



How one can use the 80/20 rule

While the 80/20 rule applies to almost every industry, the Pareto principle is commonly used in business and economics. This is because the 80/20 rule is helpful in determining where you can focus your efforts to maximize your output.

The basis of the Pareto principle states that 80% of results come from 20% of actions. If you have any kind of work that can be segmented into smaller portions, the Pareto principle can help you identify what part of that work is the most influential.



Here are a few examples of how to use the tool in practice.

Productivity

- You can use the 80/20 rule to prioritize the tasks that you need to get done during the day.
- The idea is that out of your entire task list, completing 20% of those tasks will result in 80% of the impact you can create for that day. So, in order to get the most impact done, identify which tasks have the most impact for your team and focus on those for the day.
- To do this, list out all of the things that you need to get done that day. Then identify which of those tasks have the highest impact. Do any of your tasks involve collaborating with other teammates? Are there any tasks on your plate that are blocking projects from moving forward? These tasks may be simple in execution, but they can make a large impact to the rest of the team by allowing the process to keep flowing.

Decision Making

The Pareto principle can help you to make the best decisions during the problem-solving process. When there are many different causes to one problem, the Pareto principle can help you prioritize solutions. Here are a few steps to how this works:

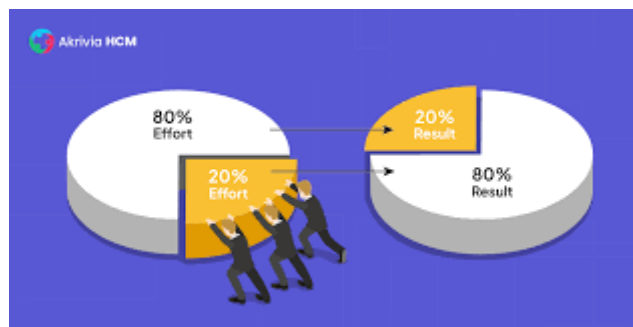
1. Identify the problems that your team is experiencing. These are the problems that you're trying to find a solution to within this decision-making process.
2. Identify the causes of these problems. Using a tool like the 5 Whys process, find all of the causes of the problems you're trying to solve.
3. Categorize your problems into similar groups. If some of the causes of the problems you're trying to solve can fall into similar categories, use this as an opportunity to group them together. This can help you decide if one solution can resolve multiple issues.

4. Assign a value to each of these problems based on the impact to the business. The value can be as simple as a number between 1-10, or actual monetary value to indicate the importance.
5. Develop a plan to focus on the top 20% of the problems that impact the business. The idea is that one solution can resolve multiple problems. Based on the values you assigned to each problem, calculate which ones are in the top 20%. Once you've identified the main problem, develop a plan to create a solution that can result in 80% of the results using problem-solving strategies.

Avoiding the Pitfalls of the Pareto Principle

Like all principles, the Pareto Principle has a few drawbacks:

- It's important to remember that the 80/20 Rule is not about reducing your workload. Instead, the Pareto Principle helps you identify the most critical, high-impact tasks on your to-do list. Don't neglect the small tasks, unimportant tasks, though. Eventually, those small tasks will become important if you let them sit too long.
- The 80/20 Rule might help you identify which of your employees are producing the most work if you're managing a team. Looking at the 20% of employees that complete 80% of the work doesn't necessarily mean you should fire everyone else. Instead, use the findings of the Pareto Rule to delegate tasks to your team fairly.
- Encourage your team to collaborate on high-priority tasks. Or assign different jobs to different people and check in with everyone to ensure they feel responsible for their part of the equation. Your employees will be encouraged to work harder if they know they're contributing to the biggest piece of the rewards—not just the minor details.



Examples

Time management

Time management is the most common use of the Pareto Principle. Many people tend to thinly spread out their time instead of focusing on the most important task.

Likewise, there is the idea that people must work excessively long hours to produce good outcomes. This type of thinking can create an unequal work-life balance, resulting in burnout and overall decreased productivity.

With the Pareto Principle, you can save time on work tasks and get more done in a shorter span of time.

For instance, you could spend some time at the start of the week planning out what you are going to focus on during the workdays, usually the most important tasks.

While this may feel like a waste of time, in the long run it can help you to focus and cut down work time.

You may find that you have more time to devote to other activities outside of work such as personal development, relaxation, mental health, and building relationships.

Relationships

With relationships, many people may want to have as many friends as possible, but they find they become overwhelmed with trying to maintain these relationships or find they don't have high quality friendships with anyone.

Using the Pareto Principle, you can look at the friends you have and work out how much time you spend with each of them compared to the amount of value they give you.

Through this analysis, determine which 20% of your relationships are valuable and supportive of you. According to the Pareto Principle, if you spend 80% of your time socializing with this 20%, your personal gains will be greater.

In a relationship with a partner, it may be helpful to consider that 80% of the problems faced in the relationship are likely caused by 20% of the couple's actions or behaviors.

The Pareto Principle can be used to identify the root causes of your conflicts with your partner, communicate about them, and focus on improving them together.

Goal setting

Often, people have never-ending to-do lists or they end up doing the least important tasks on their lists first, then find they are not motivated to complete the more important tasks.

A way to use the Pareto Principle is to write down all your goals you want to complete on a given day. Ask yourself, if you could only accomplish one of the goals on that list today, which one would have the greatest positive impact on your life?

It may be helpful to think of the consequences that can come as a result of not completing that task today. Next, pick the second most important goal, and so on.

What you will find is that you will have determined the most important 20% of your goals that will help you the most. You can then ensure you focus on completing this 20% before moving onto any other goals.

Problem-solving

The Pareto Principle can be used to help you make the best decision in problem-solving circumstances.

To help to prioritize solutions, you can follow the below steps:

1. Identify the problems that you are trying to find a solution to.
2. Identify what the causes of these problems are.
3. Categorize your problems into similar groups based on which ones have similar root causes. This can help you decide if one solution can resolve multiple problems.
4. Assign a value to each of the problems based on their impact if they were or were not resolved. You could rate them between 1-10 if this helps.
5. Develop a plan to focus on the top 20% of the problems that will result in 80% of the results.

Social Interactions

The Pareto Principle can also be seen in everyday situations, such as work meetings; imagine that a work meeting has 10 attendees.

It is likely that only a few people will do most of the talking, while the rest will listen or say very little.

In this case, the 80:20 rule applies, with 80% of the talking being done by 20% of the people in the room.

Similarly, this principle can also be applied to decision-making.

In any group decision-making situation, it is often true that 80% of the decisions are made by 20% of the people involved.

This is because some people are naturally more vocal and opinionated than others, and their opinions tend to hold more sway.

Education

The Pareto Principle is often used as a way to help students focus on their studying.

The idea is that if a student can identify the 20% of material that will be on the test, they can focus their studying on that 20% and still get a good grade.

This principle can be applied in a number of ways. For example, a student might look at their past tests and quizzes to see which topics were covered most often.

They could also ask their teacher or classmates what they think will be on the upcoming test. Once the student has a list of topics, they can start to focus their studying on those areas.

The Pareto Principle can also be applied to individual questions on a test.

For example, if a multiple-choice question has four possible answers, it might be worth spending more time studying that question if you have identified that one of the answers is correct 80% of the time.

Overall, the key to implementing the Pareto Principle successfully involves taking an analytical approach and focusing on those topics or questions that are most likely to matter.

This can help students study more efficiently and improve their performance as a result.

The effectiveness of this principle has been widely studied, and there is some evidence that it can be quite effective in helping students prepare for tests.

For example, a 2014 study found that when students used a computer program based on the Pareto Principle to choose which material they would study, they performed better on a test compared to students who did not use the program.

Given these results, it seems likely that the Pareto Principle can help students improve their performance in school by helping them focus their studying on key areas of the curriculum.

By identifying and understanding the material that is most important to learn, students can spend less time reviewing concepts they already know and more time on those that need improvement (Dunnford, Su, & Tamang, 2014).

Income Inequality

Pareto's initial 1906 observation that 80% of Italy's land was controlled by 20% of people mirrors today's estimate that 20% of the world's population controls 82.7% of wealth.

This phenomenon, known as income inequality, is a major concern for policy makers and social scientists around the world.

One potential explanation for this disparity is that the wealthy 20% are better able to take advantage of opportunities and resources than their less fortunate counterparts.

For example, they may have greater access to education or better job prospects due to family connections or networks of influence.

In addition, those in the top quintile may be more likely to engage in tax avoidance strategies and other financial maneuvers that help them accrue even more wealth (Bommier & Zuber, 2012).

Another possible factor influencing income inequality is structural changes in the economy over time.

For example, technological advances such as automation and artificial intelligence have led to an increased demand for highly-skilled workers who can operate these new technologies, while displacing low-skilled workers who are unable to keep up with the pace of change.

As a result, those with higher education levels and skills tend to enjoy higher wages and greater economic stability than those without.

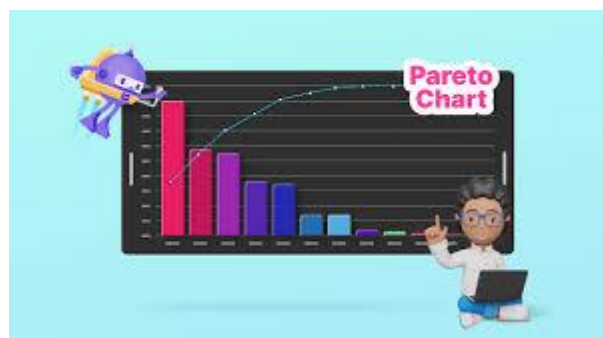
As this gap widens, those in the top quintile accumulate a greater and greater percentage of the world's net wealth (Bommier & Zuber, 2012).



WORK LESS ACHIEVE MORE
80-20 PRINCIPLE



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Please visit these following Web Pages to know MORE !

- 01] <https://asana.com/resources/pareto-principle-80-20-rule>
- 02] <https://www.investopedia.com/terms/p/paretoprinciple.asp>
- 03] https://en.wikipedia.org/wiki/Pareto_principle
- 04] <https://www.forbes.com/sites/kevinkruse/2016/03/07/80-20-rule/>
- 05] <https://www.briantracy.com/blog/personal-success/how-to-use-the-80-20-rule-pareto-principle/>
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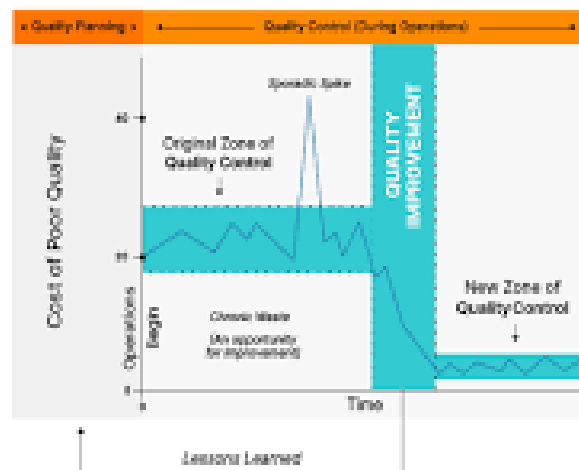


Cartoons

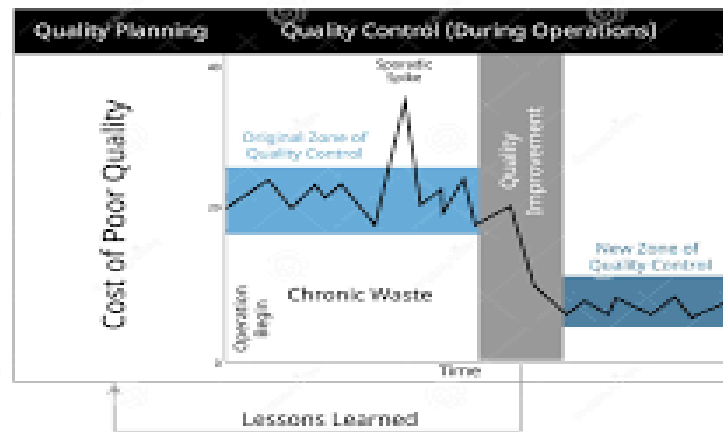
on

Juran Trilogy

Juran Trilogy Quality Planning



The Juran Trilogy



discontinuity.com

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The Juran Trilogy Diagram



JOSEPH M. JURAN

The Juran Trilogy:

Three basic processes that are essential for managing to improve quality.

Quality
Planning



Quality
Improvement

Quality
Control

Quality Philosophies - Juran

"Big Q" and "Little q"

Dr. Joseph M. Juran

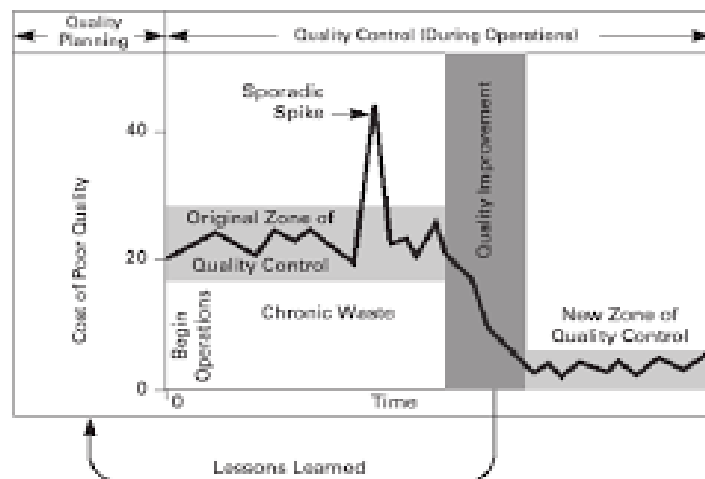
"Quality is fitness for use."

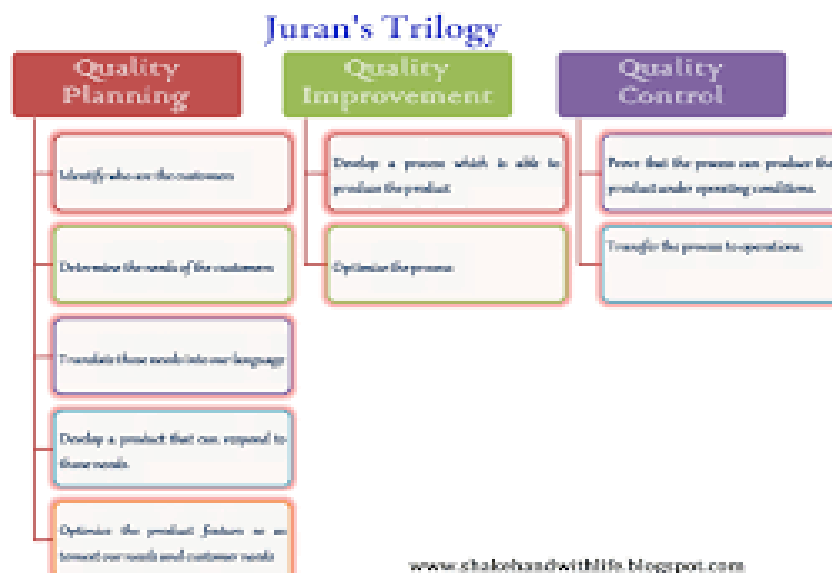
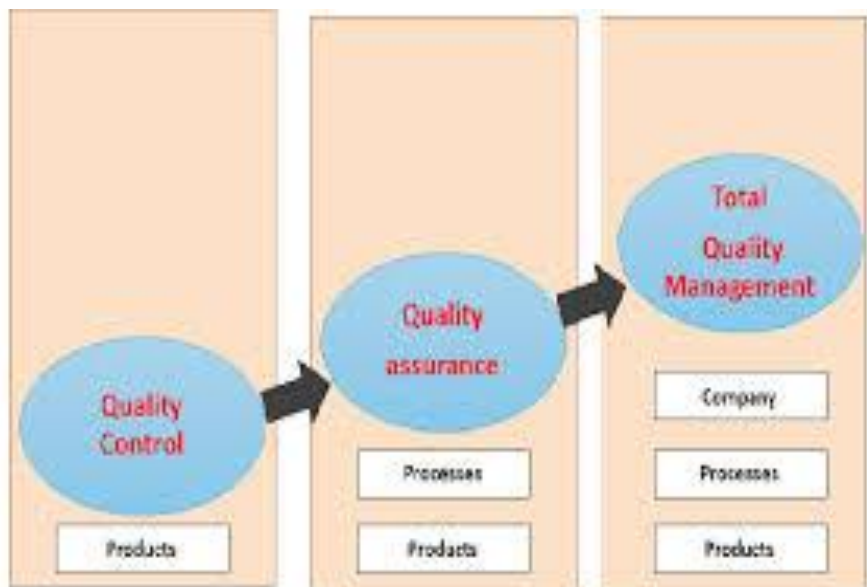


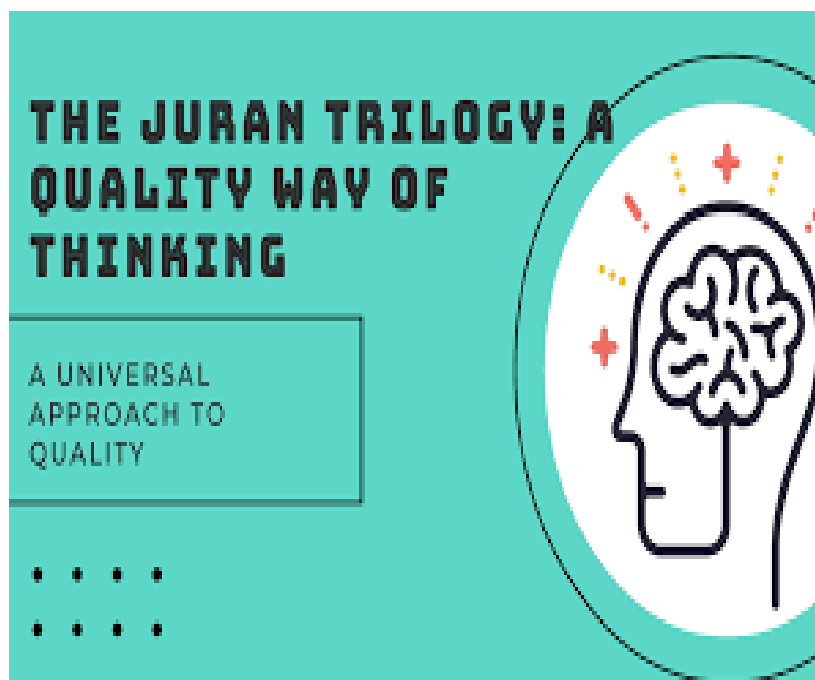
Juran Trilogy

Quality Planning, Quality Control, Quality Improvement









Juran Trilogy Concept



Juran's Quality Trilogy

Questioning which of the quality trilogy is most important is similar to asking which leg of a stool is most important. Without all three, the stool (and the quality system) cannot function effectively.



Quality Trilogy

• an improvement cycle that is meant to reduce the cost of poor quality by planning quality into the product/process



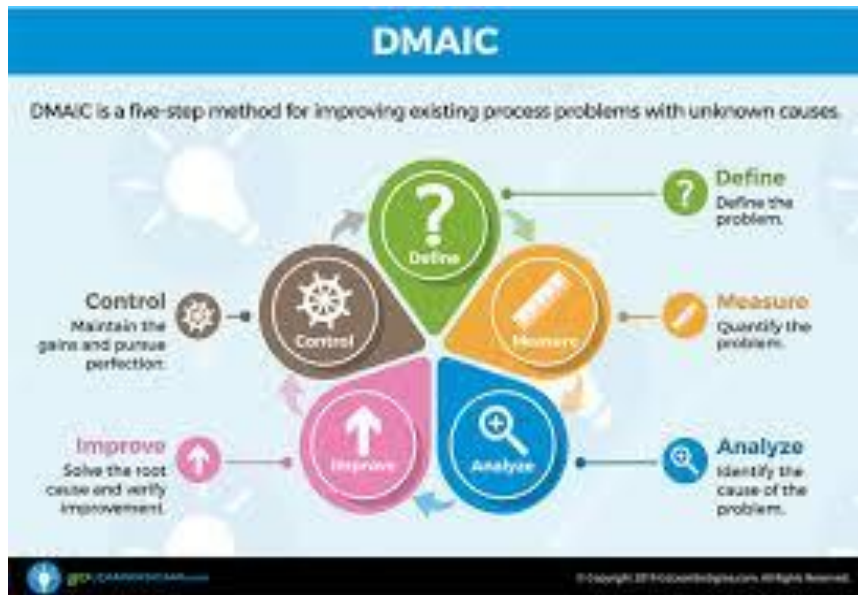
Joseph Juran: The Quality Trilogy

- Manage the work
- Improve the work
- Design and manage systems capable of delivering quality



The Juran Trilogy For Quality Management





Total Quality Management (TQM)

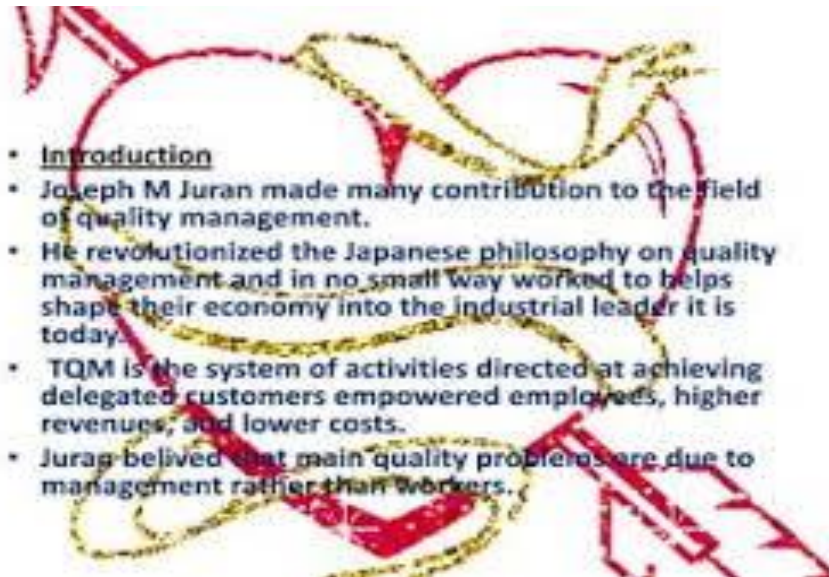
Juran Trilogy

Quality Planning **Hindi/Urdu**
Quality Control
Quality Improvement

Get a Demo Session Now

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Juran's Quality Trilogy

- Quality planning (Assurance)
- Quality control (Control)
- Quality improvement (CI)



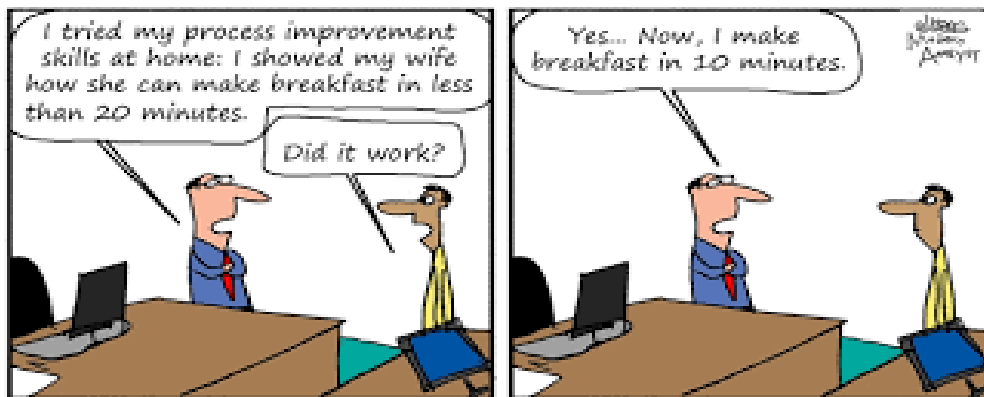
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Cartoons

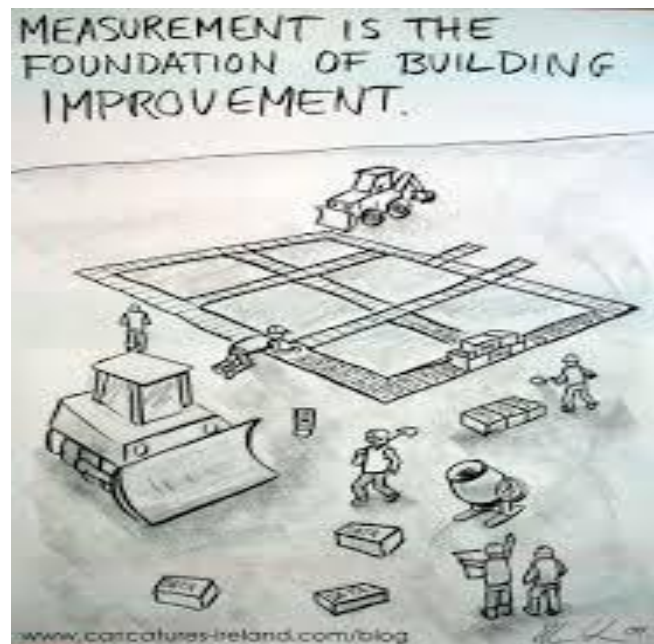
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Quality Improvement





"Do it right! Do it right! That's all I ever hear! I can't wait to get out of school and go into business!"



When less isn't more.



© 2007 WIT



"Why can't you be more like, Glazener? He's full of ideas."



Continuous Improvement



Quality/Total Quality





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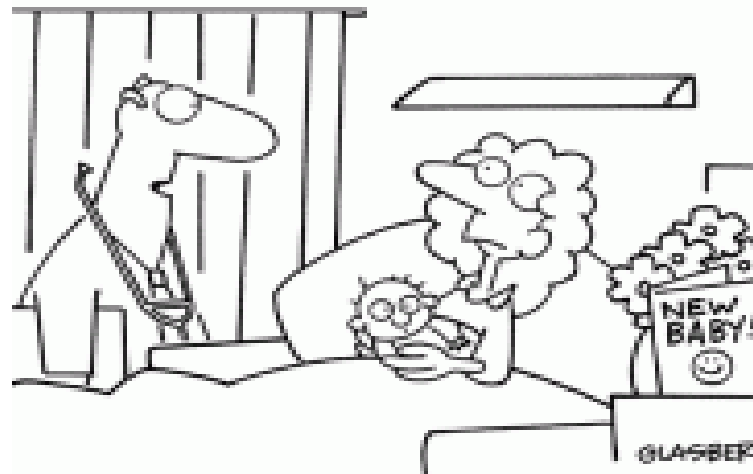


The Reality in Practice



**"We need someone to get us beyond PQM,
Partial Quality Management."**





"It's a new medical technology. Instead of crying, we can program your choice of 200 fun ring tones!"



"They've led our breakthroughs in gaming theory."



"What I'm challenging this group to do, then, is to redirect our shared passion for the idea of making money into actually making money!"



"This came in from somewhere. Could you send it somewhere else?"



"Since time is an issue, I'm trying to finish my nursing classes in one weekend. All I have to do is read these books by tomorrow."



Quality Nightmares

by MasterControl



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alamy

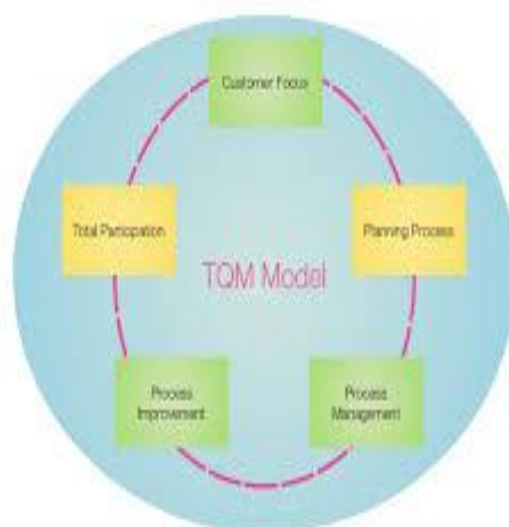
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Pictures of TQM



TQM-MODELL
Total Quality Management







What is TQM

Total Quality Management

- 01 What is TQM ?
- 02 Guru/ Leader of TQM
- 03 Evolution of TQM
- 04 Companies that implemented TQM
- 05 Primary Elements of TQM

Total Quality Management

25K+ Views

Why is TQM important?

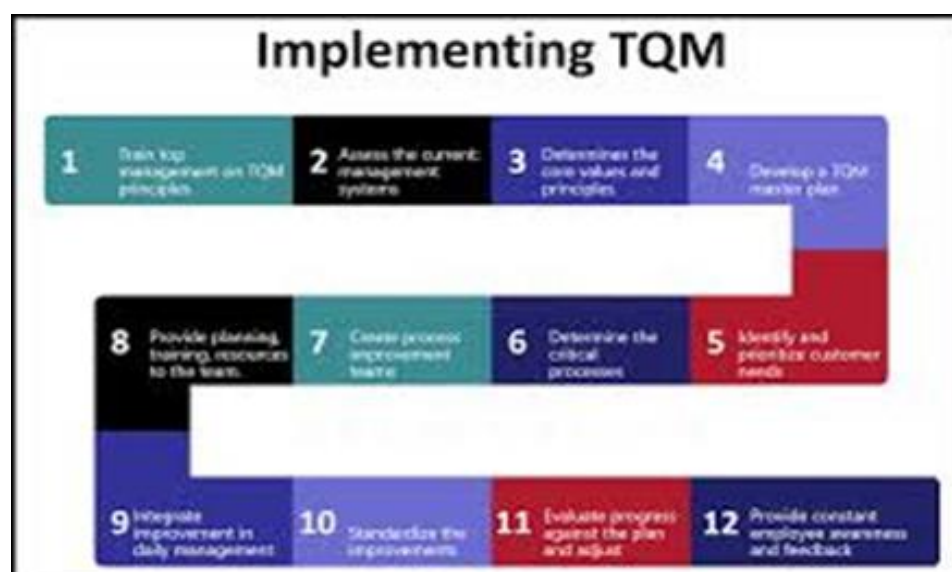
Enhances customer satisfaction

Encourages continuous improvement

Improves organizational effectiveness

Boosts employee morale

Builds a positive reputation





Introduction to Total Quality Management (TQM)



A Quality Conversation with Dr Joseph Juran

One of the most influential men in the history of business,
Dr. Joseph Juran talks to **IndustryWeek** about
what it will take for U.S. industry to
catch up in the global quality marathon.

Alone in the busy hotel lobby, his
understated presence
stands in stark contrast to his formidable accomplishments.
Capped in a navy-blue beret and carrying a small
overnight bag in one hand and a weathered
briefcase in the other, this venerable father of
quality walks unassumingly out the front door and hails a cab.
No fuss, no formality ... all business.

Once in the cab on his way to Washington National Airport,
Dr. Joseph Juran's decidedly determined gaze and
his straightforward, no-nonsense delivery command
complete attention. At 89, Dr. Juran aims to make
every word count. His mission: to help U.S. industry
close the quality gap, enabling the "Made in the USA"
label to once again be a symbol of world-class quality.
This farewell tour, dubbed "The Last Word:
Lessons of a Lifetime in Managing for World-Class Quality,"
is his last public stand in an ongoing, lifelong revolution.

If anyone can fan the flame of revolution, it is this man.
During the course of his prolific career, Dr. Juran has
consulted and lectured in 40 countries, has been
awarded more than 40 medals, fellowships, honorary
memberships, and doctorates by professional and honor
societies in 15 countries, including the prestigious Order of the
Sacred Treasure awarded by the Emperor of Japan),
and has published a total of 15 books, 40 videocassettes,
and more than 200 papers, collectively published in 16 languages.

As the taxi weaves its way in and out of heavy
Washington traffic, Dr. Juran listens to the questions,

pauses to consider them for a moment, and answers
them in a distinctly dry tone, all the while
gazing straight ahead into the traffic.

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**IW:** *We hear so much about the involvement of senior leadership in quality. Yet some people say it is possible to attain quality in companies in which senior leaders are not engaged in the effort. What do you think?*

**Dr. Juran:** It is possible, but it's ever so much more difficult. Put yourself in the position of some department head down in the middle of the organization. He wants to get something done, but it involves a number of other departments. He can go to them and say, "Look, we've got this problem to solve." The reaction may very well be, "I'm awfully busy. The boss wants this and this and so on." So, he's got to do it by persuading, by cajoling, and by threatening to get things done. It ought to be made easy for him by upper management creating a favorable climate.

Nevertheless, his conscience bothers him. He can't let this thing just sit. So he stays with it, and let's say he gets a useful result. It very likely will get him attention. And superiors may feel that, if it can be done over here, why can't it be done over there. You have the possibility of [quality] spreading. I've seen cases like that. But they're more difficult to work out, they take longer, they involve risks to the individual, and actually only very conscientious or young people who are merchantable are willing to take that risk. It's not the right way to do it.

**IW:** *In your address to the Business Roundtable last year, you mentioned that it is easy to delegate quality to someone else when there is a dedicated staff or office whose responsibility it is to administer quality. Yet Ames Corp., a 1993 Malcolm Baldrige National Quality Award winner, asserts that a dedicated quality staff was critical to its success. Why do you think it worked for Ames?*

**Dr. Juran:** What Ames said was, "We want the responsibility to be with the various line departments, but there is a need for coordination." You do something over here and there are subterranean paths in the company that affect something else. You want those things coordinated so you don't end up saving something over here and losing something over there that's even greater. If you want training done, for example, you don't set up everybody to design training courses.

There are a number of reasons for having a focal point. But in the case of Ames, as I understood it, that was for various limited responsibilities. The



basic responsibility rested with the line departments. So I don't really see any inconsistency there.

In the case of companies that feel that if there is a quality department, they delegate it to the quality department [because the responsibility] is up to them -- that's a delusion. If you want safety in a company, you set up a safety officer. He's got the job of setting up the scoreboard, investigating specific accidents that take place, and so on. But if a company's safety record goes downhill and the chief executive then calls the safety officer on the carpet for that, it demonstrates that the chief executive hasn't grasped what it's all about. He has to look to the line people to do something about unsafe conditions, find remedies, stimulate people, see that they wear their safety goggles, and so on. That's not going to be done by the safety officer.

**IW:** *What do you say to a CEO who feels that his company is client-focused enough, that it doesn't really need a quality initiative?*

**Dr. Juran:** I say more power to [him]. I think there are things he ought to do. If he decides he doesn't want to do them.... I'm no different from some physician who writes a prescription and then the patient pours it down the drain. It's his life to lead. He will also take the consequences. That doesn't bother me. There are plenty of other people who are willing to do it differently.

**IW:** *What do you make of the current fervor surrounding reengineering?*

**Dr. Juran:** Well, the advocates claim that they've got a huge, new invention that will revolutionize things.... And those who are not advocates tend to see it differently. My own view is that it's a new label for some pretty old concepts. It's a marketing device. Call it reengineering rather than whatever it used to be called -- a new buzzword.

**IW:** *What did it used to be called?*

**Dr. Juran:** Quality improvement, business process improvement. I think the word improvement has had a lot of influence within the last decade or so, and probably still does. But these labels keep changing because you've got people coming in, thinking here's a growing market for something and they'd like to get into it, and they don't want to use other people's labels, so they coin a new label.

**IW:** *Is there anything substantially different about what the advocates of reengineering are doing as opposed to what the people in the quality and improvement arenas have been doing all along?*

**Dr. Juran:** Certainly not.

### Quality Lessons from Outside the U.S.

**IW:** *You have had the privilege of watching quality being pursued in a variety of cultures. What are some of the lessons that U.S. companies should be learning from companies in other countries?*

**Dr. Juran:** Of course, they can see what results they have gotten, and then try to find out what they did differently than they had previously in order to get those results. Concentrate on the results and the deeds done to get those results. Don't theorize about how they got those results until you understand what the deeds were.

During the 1980s there were a lot of books written about the Japanese culture. It's pretty interesting, of course. And then, based on the broad perception--look how good they are at quality, look how good they are at productivity--they drew some conclusions that the culture was responsible for those results. Now that gets into something that's very suspicious in terms of analysis -- making the assumption that because things are contemporaneous, they must be related to each other. That's a very dangerous kind of a conclusion.

*We got better. We were getting better year after year. But the pace of increase--our pace was very pedestrian, very slow, where the Japanese pace was revolutionary."*

If those same books had been written back in the 1950s or 1940s, they would have described the Japanese culture and would have then described their results--which in those days were dreadful as far as quality was concerned--and would have drawn the conclusion that that culture could in no way produce good quality.

Actually, what I've gotten from the Japanese and from my own observations, which are not nearly as good as getting Japanese conclusions, is that the Japanese culture survived the shock of World War II. The culture hasn't changed. So, if the culture hasn't changed, and the results have changed dramatically, what did it? What you have to do is look to see what the Japanese have been doing differently than they did back in the days when they achieved poor quality. You have to look to the deeds in order to explain that.

**IW:** *So it's not a matter of looking at the difference between what they're doing and what we're doing, it's what they're doing now versus what they were doing 50 years ago.*

**Dr. Juran:** Of course. Here again, when the Japanese made this [quality] invasion very successfully, they took a lot of market share away from other people. The conclusion of [most] people was that our quality had gone downhill. Well, it hadn't. I used to ask them to tell me in what product had the quality gone downhill, and they couldn't do it. We got better. We were getting better year after year. But the pace of increase -- our pace was very pedestrian, very slow, where the Japanese pace was revolutionary. So there were two different slopes of lines, both of them getting better, but one of them at a much faster rate.

**IW:** *It's tempting to say that if they are achieving quality at a faster rate than we are, then it must have something to do with their culture.*

**Dr. Juran:** It's a theory. But it's not a proven theory. I can spin other theories. In fact, I do. My main theory is that they had a quality crisis worse than anybody's. Companies were threatened with bankruptcy. They'd lost their major customer, which was the military. They had to get into civilian work. They had to find out what to make, learn how to make it, and then try to sell it in the face of the dreadful reputation the country had. So they had a very severe crisis. They realized they had to change their quality image because it was a detriment to selling anything. That's the reason that they had no difficulty accepting recommendations that they get into improvement and do it fast

**IW:** *Is there anything wrong with the current pace of the quality movement in the U.S.?*

**Dr. Juran:** Well, in my opinion, the nature of the crisis is such that it demands a faster pace. Now, to be sure, our crisis wasn't as severe as the Japanese crisis. The Japanese had lost the war, and we hadn't. Now, take the Germans; they also lost the war. But in their case, their prewar reputation for quality was good. So they didn't see any reason to change anything. They weren't that affected. But our people were. Some industries just gave up. Color television is an example. We used to have a lot of American-owned companies making color-television sets. Now we have one, and they just threw in the towel. So I think we we're too slow.

**IW** *Do you think that we can regain whatever ground we may have lost?*

**Dr. Juran:** I think we can. We have the know-how, the capability, the determination, and so on, once we agree 'that we've got to solve this problem.

Our managers are pretty good, as good as any in the world. We've got one of the best situations in terms of managing. We've got some of the best young people willing to go into industry as a career, managing as a career, whereas in a lot of countries the best young people prefer to go into the professions or government, things like that. Industry doesn't have as high

a status. But in our country it does. The practice of management, the profession of management, if you wish, has a high status. So we've got that advantage.

We've got the capability once we set the goal that quality has to be top priority. And, of course, we are starting to close that gap. There have been comebacks. A company like Xerox, which lost a lot of share of market, has recovered a good deal of it. Even our automobile companies are making headway and closing the gap. And bear in mind that when you close the gap, a new force comes into play. And that's the force of patriotism.

**IW:** *Speaking of patriotism, we have recently seen U.S. industry courting the American consumer with "Buy American" campaigns. Is patriotism a valid reason to buy a product?*

**Dr. Juran:** Not if the quality difference is great and the price difference is great, because it means a sacrifice -- people willing to buy despite the fact that there are clear differences between what they can get from the Japanese and what they can get from the United States. People experimented with buying Japanese [products] at the outset. They bought [Japanese products] based on price differences. But as people bought those things, they discovered they weren't that bad, not as bad as their reputation. Then, of course, the Japanese kept getting better, got up to being adequate, then competitive, and then superior. So they picked up a big share of market, because the difference was just too great to ignore.

**IW:** *Many of us who have been following the quality movement thought that we'd be hearing from you forever. Why are you conducting a "farewell tour"?*

**Dr. Juran:** I'm not stopping; I'm going to stay with it until I drop. But what I'll be doing is writing a great deal. Mainly I think I'll be going down the route of the historian.





# An Exclusive Interview

## QUALITYDIGEST

By Scott M. Paton is Quality Digest's Editor-in-Chief.



**Joseph M. Juran** is considered by many to be the greatest quality thinker of the last century. His humble beginnings as an impoverished immigrant fuelled his drive for quality and led to countless accolades, honors and medals.

He began his career at Bell System's Western Electric in the early 1920s and developed statistical tools still widely used today. While at Western Electric, he worked with other quality luminaries such as W. Edwards Deming and Walter Shewhart.

During World War II, Juran served as an assistant administrator for the Lend Lease Administration. But following the War, he decided that big bureaucracies weren't for him. Instead, he became a freelance management consultant. He spent much of his time

lecturing, researching, writing and consulting about quality. He also made numerous trips to Japan to help rebuild its shattered economy.

In the years that followed, Juran wrote numerous books, including Juran's Quality Handbook, commonly considered to be the international quality reference book, now in its fifth edition. He also founded the Juran Institute and the Juran Foundation (now the Juran Center at the University of Minnesota) and was instrumental in starting the Malcolm Baldrige National Quality Award.

Although Juran retired from public life in 1993, he still occasionally speaks, writes and is hard at work on his memoirs.

In June, I interviewed Juran at his home in Rye, New York. Despite his 97 years, he's still physically strong and mentally sharp. Although sometimes careful with his answers, he didn't fail to speak his mind. As with the previous interviews I've conducted with him, Juran was polite, considerate and humorous.

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QD: What do you think has been the greatest achievement in the quality world during your lifetime?

Juran: That's easy: the Japanese quality revolution. Remember, Japan set out to get a place in the sun by military means. Obviously, that didn't work, so they set out to do it by peaceful means, through trade.

As they undertook to do that, they found that trade requires you to import materials, fashion them into goods and sell those goods. It's like the British did a couple of centuries ago, becoming the most important power on Earth. However, the Japanese had a big handicap: The stuff they had been exporting prior to World War II was pretty shoddy. Although they had low prices because their wages were very low, they had about the worst quality reputation in the world.

When you can't sell your stuff and the reason is poor quality, that message goes all the way to the top. They undertook to improve their quality and improve their reputation. It took a long time, about 30 years or more, but they were successful. Not only could they sell their stuff and get a large market share; it brought them to the status of economic superpower.

QD: How did the Japanese bring about this quality revolution?

Juran: They did a whole series of things. The top people took charge of quality, which was pretty unusual. They undertook to train the entire hierarchy in how to manage quality, which requires a lot of training. They opened up the business plan to include goals for quality, which was unprecedented. One of those goals was to get quality improvement every year, year after year, at a revolutionary pace. The rest of the world was improving quality at an evolutionary pace. These lines crossed, in my estimate, somewhere around 1970.

They then went beyond the revolutionary approach to improvement. They did something else that nobody in the West has managed to do: They made it possible for the workforce to participate in improvement through something called "QC Circles."

QD: After decades of improvement, why is the quality of U.S. products and services below that of the Japanese?

Juran: With relatively few exceptions, the United States is still below the Japanese as far as quality is concerned. In fact, that's true for the West, generally. Why? We have a lot of know-how about how to achieve high quality. We even have a few role-model companies that did the same thing in pretty much the same way. The approach is common for all the successful companies.

We have a strange situation: We know how to do it, but our companies don't do it. Here are some of my theories why they don't: A lot of companies have tried to improve quality, and it didn't work. They listened to consultants and spent a lot of time trying things out. Most of the time was spent learning what not to do, what doesn't work. So, a lot of companies gave up. Bear in mind, mediocre quality is still saleable. People want the services that new products bring. They buy them and take the chance that they are not going to get a lemon.

A lot of companies think that their businesses are different. They are different; they have different technology, different markets, different culture and so on. But I found when I got into consulting many years ago that every one of those different companies had common quality problems. To diagnose those problems, I used certain diagnostic tools. To find remedies, I used certain remedial tools. To hold the gains, I used certain common control tools. I was going through the same sequence of events in company after company, even though they were certainly different. So there is a body of know-how there that is common and heading toward a science of managing for quality.

A lot of companies believe that getting certified to ISO 9001 solves their quality problems. That simply is not true. ISO 9001 has some value in trying to minimize the number of assessments that are made. But the ISO 9000 series was pitched at a

mediocre level. The various ingredients that the Japanese did differently are not a part of ISO 9000. We've been taken in by the standardization people coming up with a standard that's not at the excellence level but at the mediocre level. That's inherent in the way standards are set. There has to be a consensus. The different members from companies of different standardization bodies are not going to agree to standards that their companies are not able to meet. They are starting to change the standards, but that's at a glacial pace. It takes a long time to change an international standard.

Some people think that higher quality costs more. That confusion exists in many different companies. The word "quality" has two very different meanings: One meaning is the features of the product that enable it to sell. There, higher quality generally costs more. It takes more product research, more product development and so on. People don't even call it a cost; they call it an investment, which will bring back higher returns. That's quality on the marketing side or the income side.

Quality on the cost side is quite different. The cost of failure, the internal failures--scrap, rework, slow deliveries, failure to deliver on time--and the external failures--field failures, lawsuits, safety problems.

A lot of CEOs believe that they are too busy to lead the quality charge, and so they delegate it. That hasn't worked very well. Leadership by the top people is an essential ingredient in getting out of that steep slope.

QD: You talked about ISO 9000. Are you surprised by its success and widespread acceptance?

Juran: I was astonished that it took off like it did. I am still surprised. I must say that there are indications that the people who are paying for those assessments are getting fed up. I remember in my astonishment I used to ask companies: "What are you going into this for? What you're doing is already much stricter than the criteria that are set out in ISO 9000." The answer was: "We know that. But we don't think, from a marketing standpoint, that we can be in a position where our competitor is certified and we are not. We'd be at a marketing disadvantage."

There was a stampede that started out with Admiral D.G. Spickernell, the head of the British Standards Institution. He persuaded the British military to use the defense standard in assessing defense contractors. The standards organization urged the standard on civilian buyers. It was all voluntary; there was no compulsion to be certified. That began to take hold and be strongly propagandized by the standards organization. And then, little by little, whoever got themselves certified advertised the fact that they were certified. The public didn't realize that they were being certified to

a mediocre standard. The idea that the standard was pitched at a mediocre level has never been properly brought out.

QD: Do you think that ISO 9000 has actually hindered the quality movement?

Juran: Of course it has. Instead of going after improvement at a revolutionary rate, people were stampeded into going after ISO 9000, and they locked themselves into a mediocre standard. A lot of damage was, and is, being done.

QD: What do you think of Six Sigma?

Juran: From what I've seen of it, it's a basic version of quality improvement. There is nothing new there. It includes what we used to call facilitators. They've adopted more flamboyant terms, like belts with different colors. I think that concept has merit to set apart, to create specialists who can be very helpful. Again, that's not a new idea. The American Society for Quality long ago established certificates, such as for reliability engineers. Right now, there are more than 100,000 certificates issued by ASQ.

Most people don't even understand what Six Sigma means. It is a goal. A goal of very few defects, down to defects per million. We used to think in terms of percent defective. For example, 1 percent defective is 10,000 defects per million units, a far cry from three or four. Basically, the concept is perfectly good, but there is nothing new.

It originally started with Bob Galvin, the former CEO of Motorola and a very ardent pursuer of excellence in quality. Some years ago, he gave his organization the job of improving quality and reducing the defect level by an order of magnitude. Now, to reduce it from a few percent defective to three per million, that's four orders of magnitude.

The name Six Sigma comes from a measure of what we call process capability, measuring the inherent uniformity of the process. One of the things that is inherent in tools used to achieve improvement under the label of Six Sigma is the concept of process capability. Now, to my knowledge, that concept of process capability goes back to 1926, when I was a young engineer at Western Electric. I got into a problem, and I ended up discovering that every process can be quantified in terms of its inherent uniformity. That can be compared with the tolerance limits to see whether the process is up to doing the job. In addition, you can also see whether the process is capable but is being misdirected. I am the inventor, if not the reinventor, of that concept.

QD: There is a lot of marketing hype around Six Sigma, just as there was with ISO 9000. How do you feel about that?

Juran: I am in favor of improving quality by whatever means. Right now, I think that what has really caused the spread of Six Sigma is GE. They went into quality improvement, urged, I think, by what Bob Galvin had done at Motorola. Jack Welch personally went into this. Then he went public with the results to huge acclaim and huge savings running into the billions of dollars. That got a lot of press and was pretty hard to ignore.

I don't like the hype, and I don't think the hype is going to last. Something that is as successful as the improvement process gets label after label after label. Those labels come and go, but the basic concept stays. There will be some marketer that finds a new label, finds a way to make that a fad and off he'll go, doing the same thing we did before under a new label.

QD: You were very involved with the development of statistical methodology in quality. Can you tell us about the development of statistics in quality?

Juran: The use of statistical methods in quality dates back to 1903, when the Bell System faced a problem designing its central offices. A subscriber takes the phone off the hook and gets a dial tone. That means he's connected to a line that goes to the central office. The question was, "How many of those lines do you need?" Theoretically, every single subscriber could take his or her instrument and start to use it, so you'd need a line for every subscriber. Actually, subscribers don't do any such thing. Only a few percent at one time are using it. So you need on average only a few percent as many lines as you have subscribers. Now, the question was, "Are we willing to operate at the average?" No, there'd be too many cases of a subscriber not getting a dial tone. So how many lines should you provide? That took statistical analysis. They took data: What's the rate of busyness day by day, hour by hour? Based on that, they identified when the traffic was busiest, how many lines that required, and that enabled them to make a managerial judgment as to how many trunk lines to provide. That was the earliest application of statistics in the Bell System.

Bell Labs thought that these tools might have application in the factory. In 1926 a delegation from the Bell Labs came to Western Electric's Hawthorne factory, where I was employed as a young engineer. They met with the chief inspector and some of his people. They formed a joint committee on inspection, statistics and economy, and they agreed to meet a couple of times per year.

The head guys in Western Electric soon discovered that nobody in the place knew anything about statistics, so they brought in a professor from the University of Chicago to give a course. About 20 managers and engineers attended that course, and I was one of those engineers. Then to help the committee in dealing with the statistics, they set up a little department with a boss and two engineers called the inspection statistical

department. I was one of those engineers. As the committee met and got into scientific sampling, they soon discovered the control chart, which was an invention of one of the Bell Labs' mathematicians, Walter Shewhart. Although he was a brilliant mathematician, he had a limitation: His knowledge of the factory was nil. He was a very poor communicator as far as lay people were concerned. He needed an interpreter, so I was asked to pilot him around the factory.

I had the job of selling some of this stuff to the inspection supervisors, but I very seldom made a sale. They had empirical ways and they stuck to them. So there was almost a state of dormancy there until World War II. At that time, the War Production Board, whose job was to harness the civilian economy to the military machine, set up a department to help improve quality in the military. As luck would have it, they appointed two professors to head that department. They concluded that in order to improve quality, we should teach the factories statistics.

Eugene Grant of Stanford University went around the country giving these courses for free. A lot of companies sent their young engineers. Now, these courses didn't affect who won the War, but they had a tremendous effect on the people who attended those courses. They were meeting people from other companies for the first time in their lives. It was wonderful to be able to exchange information. They formed a bunch of quality societies in different cities around the country. Those finally became the ASQ. They created a journal that at the outset contained nothing but statistics. It took a long time for the idea that managing for quality is the important thing, and statistics is a part of that. They resisted that. To them, statistics was everything.

Ed Deming went to his grave believing statistics is everything. If you make use of statistics, everything gets resolved. Of course, he never managed anything. He didn't know about managing.

QD: Obviously, you've achieved tremendous success in your lifetime. To what do you attribute that success and your drive for achievement?

Juran: I'm surprised that it happened. I've kept a pretty low profile. I keep the publicity people at the Juran Institute on a pretty short leash. I don't like flamboyant statements about myself. I started out like any other recruit in a big company. I was recruited out of engineering school, I did some useful things for my bosses and I got promoted. That was a mistake. They took a pretty good analyst and made a lousy manager out of him. At the end, I found that my weaknesses in human relations had caught up with me, and I was finished. I knew I wasn't going to go any higher in the organization.

When World War II came along, I was appointed the assistant lend lease administrator for the Foreign Economic Administration.

At the end of the War, I had to figure out what I was going to do. I realized I had gotten to be kind of a misfit in these big bureaucracies, and I opted to become a freelance consultant. I wanted to be more than a consultant: research, consult, philosophize, write, lecture, the works. Of course, there wasn't any ready-made job like that. I had to piece one together, and it worked out wonderfully.

I also had an urge to write. It was an itch I had for a long time. So I wrote a great deal. Every month I wrote articles for the journals of the ASQ, the American Management Association and others. Those were read by a lot of people. Also, while I contemplated making that change, I had in mind preparing a comprehensive work on the subject, which came to be known as the Quality Control Handbook, which is now in its fifth edition. That brought me to the attention of a lot of people in the field. So, one thing seemed to follow another. In fact, at the time I became a freelance individual, I didn't want any kind of organization. I didn't want to be a boss, and I didn't want to be a subordinate. Things seemed to grow naturally. All of those medals and honors were just byproducts of that.

QD: Which of your achievements are you the most proud of?

Juran: I'd be pretty hard put to answer that. I am not even sure that I am proud. I am an immigrant, and I came from a pretty impoverished family. I lived in a neighborhood where everyone else was poor. Your outlook is very different when you start out that way. My goal in going into higher education was just getting away from all of that. I discovered in all the different jobs I held in those days that the employers favored someone who was going for an education. It seemed to be the passkey to getting out of poverty. You learn some pretty useful habits if you have to live in those circumstances. You're not afraid of long hours or hard work.

QD: What advice would you give to someone just starting out in quality today?

Juran: I would start out by saying, "Are you lucky!" Because I think the best is yet to be. In this current century, we are going to see a lot of growth in quality because the scope has expanded so much. We used to think that it was a factory problem. No more. It has expanded from the factory to the offices to the warehouses and away from manufacturing to all the other industries, including the giants: health care, education and government.

Quality Improvement: 10 Steps

JURAN'S 10 POINTS THEORY FOR QUALITY IMPROVEMENT

1. **Build awareness of need and opportunity for improvement:**

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Realize that all processes are improvable. Taking an example of mistakes published a newspaper they made the previous day, Juran say that they should:

- Survey the staff, asking them why the mistakes were made;
- After a week, select the top ten reasons;
- Decide how to make sure those mistake-causing steps aren't repeated;
- Keep track of the number of mistakes being made, to make sure they are decreasing.

Now we have just created a quality improvement program!

2. **Set goals for improvement:** Juran's formula for results is

- Establish specific goals to be reached.
- Establish plans for reaching the goals.
- Assign clear responsibility for meeting the goals.
- Base the rewards on results achieved.

3. **Organize to reach your goals:**

- Establish quality council
- Identify problems
- Select projects
- Appoint teams
- Designate facilitators

4. **Provide training:**

Any company, which has been actively engaged in moving towards TQM in the past few years, knows how important education and training are. The concepts, methods and tools for modern quality management are new for most members of the company -- managers, professionals and workforce. The investment in education and training is high, but the rewards are great.

5. **Carry out projects to solve problems:**

Large improvements are usually the result of interdepartmental or even cross-functional quality improvement teams. These teams tackle the chronic problems that have been in the way of company progress for a long time. These are the vital few problems that create the breakthroughs in quality by reducing waste and improving customer satisfaction dramatically.

6. **Report progress:**

Importance here is on the progress expected and the actual progress achieved. Necessary actions to improve the status can be initiated to reduce the variance. Information on the progress also provides the management the confidence on the Improvement activity and further support if required.

7. Give recognition:

Recognition is a means of providing morale to both those involved in the improvement activity and all others in an organization. This is an important activity to be done by the management as improvements provide a change for betterment resulting in savings to the company and at times, the improvements are made possible against lot of criticisms. Recognition rejuvenates the spirits and makes it possible for improvement areas in other spheres.

8. Communicate result:

Lesson learnt during the improvement process requires to be shared to create an awareness of the approach taken and the possibility to learn and improve further. It also provides an outlook for people in other areas to the basis for triggering similar improvements in their areas.

9. Keep score:

A Company's goals are achieved step-by-step. Each step taking it nearer to the targeted goals. Further steps to be taken shall involve an action based on the lesson in the previous steps. Tracking the progress and measuring it provides the management the leverage to control the process.

10. Maintain momentum by making annual improvement part of the regular process of the company:

Actions taken in the above steps shall involve the people and sustaining their involvement in improvement activity is a must to achieve the long-term organizational goals and to remain competitive. Juran approach is very many people oriented and it places a strong emphasis upon teamwork and a project –based approach.

Expanding the Quality Planning Roadmap discussed earlier, it can be seen that Juran concepts are applied to design of **Quality Systems** in Software Industry.

Source: <https://goodmorningishan.blogspot.com/2011/08/jurans-10-points-theory-for-quality.html>

A Comparative Case Study

Joseph Juran's 'Ten Steps of Quality Improvement'

Vs.

Philip Crosby's 'Quality Is Free'

Author: Mustafa Hamoudi Shakir

Published: 26 Jul 2013

Source: <https://www.linkedin.com/pulse/comparative-case-study-joseph-jurans-ten-steps-quality-shakir>

Introduction:

Two major individuals in the area of quality management, Joseph Juran and Philip Crosby, have made a lasting impression with their respective publications, "Ten Steps of Quality Improvement" by Joseph Juran and "Quality Is Free" by Philip Crosby. This case study explores the key principles and methodologies presented in each book and how they have influenced organizations' approaches to quality improvement.

Background of the Authors and Books:

Joseph Juran was a well-known quality management specialist who was well-known for his pioneering work on quality improvement. In his book "Ten Steps of Quality Improvement," Juran presents a thorough method to achieving quality excellence and organisational success. On the other hand, Philip Crosby, a well-known quality guru, presents his "Quality Is Free" concept, in which he advocates for the goal of zero faults and its impact on organisational economic success.

Joseph Juran's 'Ten Steps of Quality Improvement'

Juran's book introduces 10 actions that organisations can take to establish a successful quality improvement programme. Establishing the quality improvement infrastructure, creating targets, identifying quality-related challenges, and selecting improvement projects are among the tasks involved. Juran emphasizes the need of incorporating employees at all levels in the development process, and his method focuses on identifying and addressing issues through data-driven, statistical analysis of processes.

'Quality is Free' by Philip Crosby

Crosby's book is based on the principle of "Zero Defects," which means aiming for perfection and eliminating faults in all processes. He defines the "Cost of Quality" and emphasizes the importance of prevention as the most cost-effective approach to quality management. Crosby believes that achieving zero faults requires a culture of continuous improvement, employee involvement, and a customer-focused strategy.

Principles that are similar:

Both Juran and Crosby emphasize the necessity of leadership commitment to quality improvement and prioritize customer happiness. They emphasize the importance of employee participation in recognising and resolving quality concerns. Furthermore, both authors urge for data-driven decision-making in order to quantify and monitor quality performance.

Differences in Approaches:

While Juran's approach concentrates on the systematic application of quality improvement processes and the use of statistical tools for analysis,

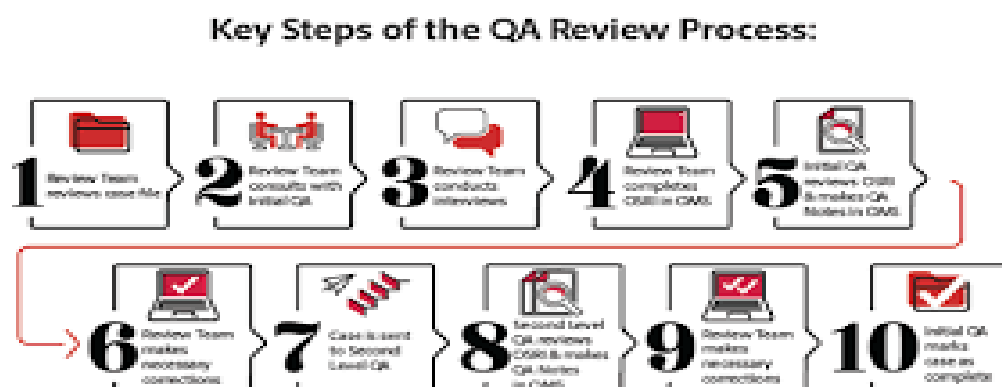
Crosby's philosophy emphasizes on the simplicity of zero faults and the development of a culture of prevention in order to attain quality perfection. Crosby's ideology concentrates around the core premise of zero flaws, but Juran's technique is complete.

Real-World Impact:

Organisations all over the world have used Juran's and Crosby's concepts to improve their quality management practices over the years. Companies that used Juran's technique saw increased process efficiency and reduced defects as a result of data-driven decisions. Organisations who have adopted Crosby's zero-defect mindset, on the other side, have claimed increased customer satisfaction, improved reputation, and cost savings due to reduced rework and waste.

Conclusion:

Both Joseph Juran's "Ten Steps of Quality Improvement" and Philip Crosby's "Quality Is Free" have had a significant impact on the quality management industry. Crosby's ideology is centered on simplicity, zero flaws, and prevention, whereas Juran's methodical approach emphasizes statistical analysis and employee interaction. Quality, customer satisfaction, and overall business success have all improved significantly in organisations that have effectively implemented these concepts. Because each methodology is tailored to distinct organisational goals and settings, combining the two techniques may be beneficial in achieving a thorough and successful quality improvement journey.



HISTORY

of

Quality Management System

<https://www.juran.com/blog/quality-management-system/>

It's easy to think of the concept of quality management as strictly a modern-day phenomenon. In fact, some of the core concepts of quality control can be traced back as far as medieval Europe, where 13th-century craftsmen's guilds developed stringent product quality standards, with compliant goods being marked with a special symbol by inspection committees. Similar quality control methods remained in use for centuries, and were embedded into many systems throughout the Industrial Revolution from the mid-1700s to the early 19th century. As traditional craftsmen increasingly found employment as factory workers, quality in the workplace was measured through audits and inspections, with defective end goods either scrapped or reworked.

The Early 20th Century

Quality management systems, as we now think of them, first started to be developed in the 1920s, as statistical sampling techniques were introduced into quality control methodology, pioneered by Walter A. Shewhart – sometimes referred to as the father of statistical quality control. During this period an ever-increasing demand for greater and greater productivity saw a breakdown in quality control, and it was clear there was a requirement to develop a more robust, structured and logical approach to quality. Crucially, this would involve a shift from simple end-product inspection to the development of quality practices aimed at actively preventing defects by implementing checks and controls earlier in the production process. Key to the development of the total quality management techniques that industries still rely on today were experts such as Joseph M. Juran and W. Edwards Deming.

Joseph M. Juran

Dr. Joseph M. Juran is considered by many to be the father of many of the quality management techniques still used in industry today. Born in Romania in 1904, after his family emigrated to the United States he gained a degree in electrical engineering.

In the years following World War I he began working for the Bell System, which saw his introduction to statistical sampling and quality control. During World War II, Juran served as an administrator in the government's Lend-Lease Administration, and at the war's conclusion opted not to return to Bell, in favor of furthering his work in the field of quality.

After taking a position at New York University's Department of Industrial Engineering, Juran spent the following years refining his theories on quality control while lecturing and consulting extensively for businesses. He also began writing what would become his acclaimed Quality Control Handbook, which was first published by McGraw-Hill in 1951. Juran's handbook is still in print – currently in its seventh edition and considerably expanded from the book's original publication – and is still widely regarded as the go-to text on quality control.

Dr. Juran's reputation in the field of quality management spread not just nationally, but worldwide. In 1954, the Union of Japanese Scientists and Engineers invited Juran to Japan to discuss the theories and techniques he had developed over the years. While there, he held sessions with senior and middle managers from various Japanese firms, explaining how to incorporate quality control activities into their processes.

Juran's visit to Japan helped to kick-start a change in attitude to quality control in the nation's industries, creating a culture within which, over the following years, quality processes became ever more integrated into management thinking and everyday working practices. This allowed Japanese industry to produce higher-quality exports at lower prices, giving it a considerable advantage on the world stage. From the mid-1960s, Juran was highly influential in spreading Japanese attitudes to quality to more widespread application in the United States.

Dr. Juran's quality management approach is based on three key principles. The first is application of the Pareto principle – also known as the "80/20 rule." In the context of quality, this means identifying "the vital few and the trivial many" – in other words, the small percentage of root causes in manufacturing or service processes that account for the largest effect in terms of defects or cost.

The second principle of Juran's approach to quality is management theory. This involves a change of thinking away from mere focus on the quality of the end product, to a wider examination of the human dimension of quality management. Education and training for managers in the workplace is as important as the nuts and bolts of the manufacturing process, while other human factors such as resistance to change

also need to be accounted for. Juran's management theory was fundamental in expanding quality management principles beyond the factory floor to principles that could also be applied to service-related processes.

The final principle consists of three processes often known collectively as the Juran Trilogy. These three elements are quality planning (the design stage), quality control (ongoing inspections to ensure that processes are in control) and quality improvement (including proactive refinement of processes to improve processes).

In addition to many decades of work on quality management and consulting with organizations worldwide, in 1979 Dr. Juran founded The Juran Institute, with a mission to "create a global community of practice to empower organizations and people to push beyond their limits." Still operating today as Juran, the institute he founded remains focused on equipping organizations with the tools they need to achieve long-term solutions to everyday problems.

W. Edwards Deming

Quality management as we understand it today would likely not exist without the contributions of another key figure – W. Edwards Deming. Deming was born in 1900, and by the age of 28 had gained degrees in engineering, mathematics and physics, and a doctorate in mathematical physics from Yale. He spent the next decade writing and lecturing in the fields of math, physics and statistics, and during this time became interested in the statistical quality control principles of Walter Shewhart. Specifically, Deming was interested in expanding Shewhart's techniques beyond manufacturing, to administrative and management activities.

Deming worked with the US Census Bureau from 1939, and his development of Shewhart's statistical process control innovations resulted in a six-fold increase in productivity. After World War II, Deming was posted to Japan as an adviser to the Japanese Census. In common with Dr. Juran, Deming became involved with the Union of Japanese Scientists and Engineers, and his contributions directly led to the development of what we now recognize as total quality management becoming widespread in Japanese industry. His work is believed to have contributed greatly to the reconstruction of Japan's post-war economy, and in 1960 he was awarded the Order of the Sacred Treasure for his services to the nation's economic resurgence.

While Deming's management principles weren't widely adopted in the United States over the next couple of decades, by the early 1980s it was evident that there was a gap in quality between Japanese and American products. One of the first US

companies to seek Deming's input was Ford Motor Company, which between 1979 and 1982 had incurred \$3 billion in sales losses. As a consultant, Deming asked tough questions about the company's organizational and management culture – ultimately claiming that management actions were responsible for 85% of quality problems. As unwelcome as this message may have been, by 1985 the changes that Deming had introduced contributed to Ford becoming the most profitable US auto company.

Edwards Deming died in 1993, but in the years before his death he continued consulting, and authored a number of seminal books, including *Quality, Productivity, and Competitive Position* – later retitled *Out of the Crisis* – which outlined his critical “14 Points for Management.” Shortly before his death, Deming founded the W. Edwards Deming Institute, which continues to honor his legacies today.

The Quality Revolution

The modern quality revolution began in the 1970s, when the quality of Japanese goods surpassed those of the US and Europe. Action was taken to combat the imbalance and the 1980s saw a big emphasis on quality improvement, plus the adoption of new practices such as Just in Time (JIT).

By the 1990s, quality improvement methodology that had proved successful in manufacturing was being applied to the working practices of organizations. Toward the end of that decade, Motorola developed the concept of Six Sigma, which asserts that all products and processes must strive for perfection, and Juran's method had been employed to create the data-driven improvement cycle, DMAIC.

The 2000s saw the combination of Lean and Six Sigma, plus other continuous improvement methods.

Finally, in the 2010s, Continuous Improvement and Quality 4.0 were introduced.

Evolution of Quality Management Certification Systems

The following is a timeline of key dates and events in the evolutionary process of quality management certification systems.

1959: U.S. Dept. Defense MIL-Q 9858 Standard is established.

1969: MIL-Q 9858 is revised into the NATO (North Atlantic Treaty Organization) AQAP (Allied Quality Assurance Publications) series of standards for quality assurance systems.

1974: BSI (British Standards Institution) publishes the BS 5179 "Guidelines for Quality Assurance."

1979: BSI publishes the BS 5750 series of standards.

1987: ISO – the International Organization for Standardization – publishes the ISO 9001 standards, based on the BS 5750 series.

1994: ISO releases the first revision of the ISO 9001 standards.

2000: ISO releases a second revision and merges ISO 9002/3 into 9001.

2008: The third revision of ISO 9001 is released.

2015: ISO 9001:2015 is released and becomes a guideline for organization-level quality management systems, and closer to a TQM model.

The First Gurus of Quality

Become a Champion of Quality Within Your Organization

Take your first steps into learning Lean Six Sigma methodology and tools with our Lean Six Sigma experts. Save your seat on our next public program and become a Juran certified Yellow Belt.

W Edwards Deming

William Edwards Deming is recognized as the leading management thinker in the field of quality. His philosophy espouses cooperation, and continual improvement for both individuals and organizations. An essential element is that it avoids apportioning blame, but instead recognizes mistakes as opportunities for improvement.

Juran

Dr. Juran has a well-deserved reputation as the founder of a range of quality management techniques. His quality management approach is based on three key principles: the Pareto principle; quality management principles; and the Juran Trilogy – quality planning, quality control, and quality improvement.

Feigenbaum

Armand V. Feigenbaum is known for his work on total quality control, and quality costs. He is the originator of the concept of the “hidden plant,” the assertion that a proportion of the capacity of every factory is wasted due to not getting things right first time.

Shewhart

Walter A Shewhart honed his skills while working at Bell Telephone, where his work focused on reducing variation in a manufacturing process. He was recognized as the originator of statistical quality control (SQC) and also created the “Shewhart cycle”, or “Plan-Do-Check-Act” (PDCA).

Shingo

Shigeo Shingo was a frontrunner in continuous process improvement and operational excellence. He developed the concept of the Single-Minute Exchange of Die (SMED), aimed at cutting waste in manufacturing processes. His ideas have impacted Lean Six Sigma principles such as increasing operational efficiency, and nurturing a culture of continuous process improvement.

Crosby

Philip Crosby found fame on publication of his book *Quality is Free*, in 1979. In addition to that, he is known for the principle of “doing it right the first time” (DIRFT) and the Four Absolutes of Quality. (The performance standard of “Zero Defects” is the third absolute.)

Taguchi

Genichi Taguchi's methodology pushes the concepts of quality and reliability back to the design stage. It constitutes an efficient technique for designing product tests prior to the commencement of manufacturing, so ensuring quality, not defect, is designed in. In 1960 he was awarded the Deming Application prize.

Ishikawa

Kaoru Ishikawa introduced the concept of quality circles and was a fervent believer in the need for quality to be company-wide. He is arguably best-known for the Ishikawa Diagram – also known as the fishbone or cause and effect diagram – used to identify the root cause of an event and commonly employed in quality defect prevention initiatives.

Driving Quality Today

Joseph A. DeFeo

Dr. Joseph A. DeFeo, Past Chairman and CEO of Juran, is one of the world's leading experts on transformational change and breakthrough quality management. He has been at the forefront of his field for over 35 years and has advised numerous businesses and business leaders, helping them to increase sales, reduce costs, and improve customer experience.

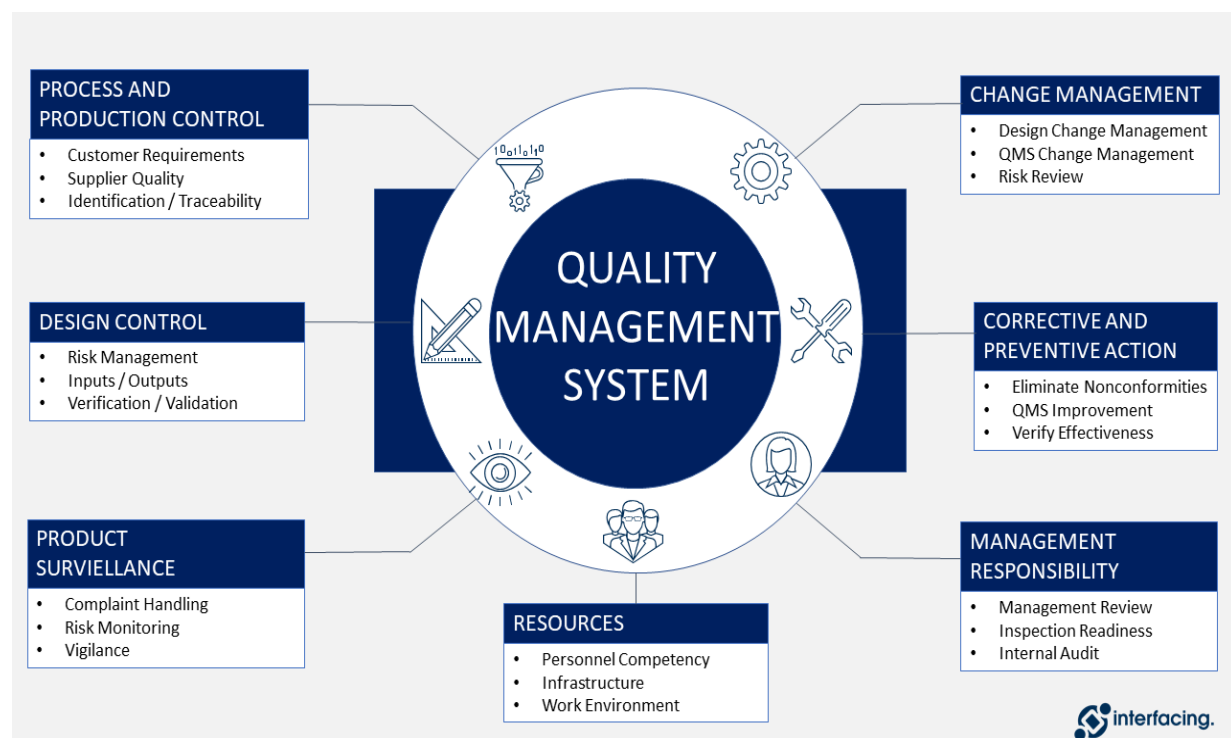
Noriaki Kano (Kano Model)

Noriaki Kano recognized that different attributes of a product or service had different levels of value to a customer, meaning some created higher levels of customer loyalty. From that he developed the Kano model – a ranking system that distinguishes between essential and differentiating attributes related to concepts of customer quality. He is the author of books including Guide to TQM in Service Industries.

The Present and Future of Quality Management

To this day, individuals and organizations are benefiting from the work and teachings of both Dr. Joseph M. Juran and W. Edwards Deming, alongside other thought leaders such as A. V. Feigenbaum, Philip Crosby, and Kaoru Ishikawa. Quality management systems used by modern organizations incorporate, but have also evolved beyond, the fundamentals developed by the key 20th-century quality pioneers.

Mature quality control systems such as continually developing ISO standards, as well as key process improvement tools such as Six Sigma, continue to perform as guiding principles across the world. Organizations such as Juran's continuing commitment to sharing knowledge through training, certification and consultation help to contribute to the ongoing development of quality management skills and techniques across the world.



Selected Articles

on

Joseph M Juran

The following **SIX** articles on the life and works of Dr Joseph M Juran provide the variety and depth of his skills in quality.

01] Three Experts of Quality Management

J Gerald Suarez, Department of the Navy, Office of the Under Secretary of the Navy, Total Quality Leadership Office, Arlington, VA 22202-4016

02] Quality Planning for Impactful Improvement: A Mixed Methods Review

Victoria Ruth Tallentire, Catherine Anne Harley, Simon Watson

03] The Roadmaps of TQM in the Greek Education System according to Deming, Juran and Crosby in the light of EFQM Model

Sofia D Anastasiadou, University of Western Macedonia, Greece

04] Perspective Of Joseph M. Juran's Educational Quality Development Model and Implementation in Educational Prospects

Ulfia Andriani, Universitas Nurul Jadid

05] Quality Revolution in Japan: Role of Dr. Joseph M. Juran

Bikram Singh, Assistant Professor, Department of Commerce, University of Calcutta

06] Joseph Juran: Overcoming Resistance to Organisational Change

Mark Best, Duncan Neuhauser



Department of the Navy
Office of the Under Secretary of the Navy
Total Quality Leadership Office

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Philip B. Crosby
W. Edwards Deming
Joseph M. Juran

by
J. Gerald Suárez



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ABOUT THE TQL OFFICE

The TQL Office is a part of the Office of the Under Secretary of the Navy. Its mission is to provide technical guidance to the Department of the Navy Executive Steering Group (ESG).

The ESG group was chartered by the Secretary of the Navy in 1989 to lead the transformation to a quality-focused organization. Its members include the Vice Chief of Naval Operations, the Assistant Commandant of the Marine Corps, the assistant secretaries, the systems commanders, and other selected Navy and Marine Corps leaders. Under Secretary of the Navy Dan Howard chairs that group.

One of its first actions was to create the TQL Office to ensure that its plans and actions for TQL training and implementation would be consistent across the organization. Progress has been significant:

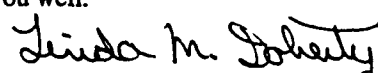
—In February 1992, the ESG published a vision statement, guiding principles, and strategic goals for the Department of the Navy. These documents lay the foundation for the Department's strategic plan. They say, in effect, that the entire organization will focus on quality as it plots its course for the future.

—In April 1992, the Department's TQL education and training program was brought "on

line" on both coasts, staffed by a cadre of TQL specialists who are providing education and training to senior leaders and command-level TQL coordinators and quality advisors. It is an ambitious program, essential to reaching the "critical mass," those people within an organization with the requisite knowledge, power, and leadership to sustain a cultural change.

—The TQL Office is publishing a newsletter to communicate the activities of the ESG and to provide a forum for the exchange of information and ideas related to TQL. The newsletter also provides a vehicle to document stories about how TQL principles and tools can be applied to military settings.

The TQL Office publishes other materials such as this report. The intent of the publications series is to clarify what TQL is and how it works within our organization. We hope it serves you well.



LINDA M. DOHERTY

Director

Total Quality Leadership Office
Office of the Under Secretary of the Navy



**Department of the Navy
Office of the Under Secretary of the Navy
Total Quality Leadership Office**

THREE EXPERTS ON QUALITY MANAGEMENT:

**PHILIP B. CROSBY
W. EDWARDS DEMING
JOSEPH M. JURAN**

by
J. GERALD SUAREZ



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FOREWORD

U.S. leaders are focusing today on quality to restore the country's competitive edge. We know now that an emphasis on quality improves overall productivity and reduces costs.

As a nation, we used to think just the opposite, that quality costs, that you have to create products of high quality. As a result we emphasized productivity at the expense of quality and began to lose many of our customers as competition increased. Our customers wanted quality and the competition was able to offer it at a price that customers were willing to pay.

We're smarter now. *Quality is defined by the customer.* It always has been, but we didn't have to listen after World War II when everything we produced, good or bad, had a market. Now we know that if we understand what quality means to the customer, how the customer defines quality, and we meet those criteria, we are on our way to creating new markets and, perhaps, recapturing others.

One question we frequently ask ourselves goes something like this: "If Japan can, why can't we?" Those words were used in the title of a 1980 NBC documentary that forever changed the way we look at ourselves in the world marketplace. During that broadcast, commentator Lloyd Dobyns told us the chilling tale of a nation rapidly losing its economic might. At the same time he offered us some hope in the person of W. Edwards Deming, American statistician and quality expert. What Deming taught the Japanese back in the 1950s and what he was proposing for American businesses seemed, in 1980, to be revolutionary to viewers, but the bottom line could not be argued. Quality paid, and paid handsomely.

Since then, a number of U.S. businesses and government agencies have heeded the advice of W. Edwards Deming, Philip B. Crosby, Joseph M. Juran, and others. Hewlett-Packard, Xerox, and Motorola, for example, have demonstrated that a focus on quality will reduce production costs because money is no longer spent on waste and rework. The savings can be reinvested in new technology and in reducing the cost to the customer.

A number of Federal agencies have reached the same conclusions. Their leaders know that services, like products, are the result of processes that can also be analyzed and improved. The General Accounting Office recently adopted a Total Quality Management (TQM) approach for its own organization after studying the successes of private industry. The Internal Revenue Service now views the taxpayer as the customer, a change having profound effect on its relationship with the public.

Probably the most dramatic progress within the Federal Government has taken place within the Department of Defense (DOD), and, in particular, the Department of the Navy (DON). This report concludes with a description of the DON's quality initiatives undertaken to meet the challenge of becoming a leaner, but more efficient and effective organization in the face of massive budget cuts. I describe this crisis in Mary Walton's most recent book (*Deming Management at Work*, 1991).

We have a sense of urgency. If any private-sector company was faced with a drop in their bottom line of the sort that we are anticipating over the next five years, they would declare bankruptcy tomorrow and walk away. What we are looking at in the most rosy of scenarios would amount to catastrophic failure in the private sector.

If we're going to maintain a viable maritime force over the next decade, we have to find a way out of the crisis, and one of those ways is through quality-focused management and streamlining every efficiency we can get from everywhere, because we're not going to get any more money. We're going to get a hell of a lot less . . . Ten years from today there's no way we can predict where our budget's going to be, except we can be absolutely sure we're going to be a smaller organization than we are now, with an undiminished mission, and that is to protect the national interest of this country. (pp. 150-151)

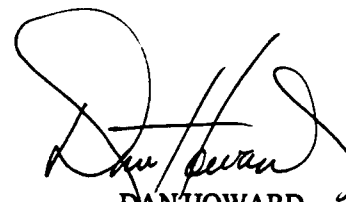
Even when organizations become convinced that they need to do business in a new way, they often don't know where to begin. There are a number of approaches, but what are they really saying and how do they compare? The leaders in the Department of the Navy asked the same questions before adopting the Deming philosophy. Deming emphasizes leadership responsibility and integrates process improvement methods with new methods for leading people, critical components for an organization as large and complex as the DON.

Those who begin to study quality-focused management systems soon run across the names of Crosby, Deming, and Juran. These three have been carrying the message of quality to the world for decades. As much as we know about each man individually, little has been published that compares the three approaches. The author of this report, J. Gerald Suarez—researcher, instructor,

and consultant for the Department of the Navy Total Quality Leadership Office--describes the three approaches and compares one to the other. To write this report, he attended the Crosby Quality College, Juran Institute seminars, and Deming's 2-day and 4-day seminars. He brings to the material a balanced treatment.

A word of advice for readers outside of the Department of the Navy. Each organization has a unique mission and a unique culture. If you are reading this report to help you make a decision about which way to go, remember that what you choose must support your own special requirements. You may find that none of the approaches described here would work for you, but from your reading

you will have a better understanding of what to consider. What is the role of leadership? How is quality defined? How are the roles of suppliers and customers addressed? To what extent are employees involved in quality efforts? We hope this publication will help you in your quest.



DAN HOWARD

Under Secretary of the Navy

THE AUTHOR



J. Gerald Suárez is a Ph.D. candidate in industrial and organizational psychology at the University of Puerto Rico. He has been involved in quality management since 1985, when he conducted research on the implementation of the Deming management approach at Hewlett-Packard.

Gerald started his career as an industrial psychologist for a private consulting firm, focusing on quality management issues. In 1987 he was hired by the Navy Personnel Research and Development Center (NPRDC) in San Diego, California, as a personnel research psychologist. At NPRDC, he was both instructor and consultant within the Department of the Navy and the Department of Defense (DOD). He wrote a number of reports on TQM/TQL education, among them a report that describes a strategy

for educating the DOD acquisition work force in TQL, and another that presents an education and training plan for TQL in the DOD. He also coedited a report of selected readings in TQL implementation.

Gerald received a Fleet Support Service award in 1991 for providing initial training to the TQL Fleet Teams formed by the the Chief of Naval Operations to lead TQL demonstration projects in selected Fleet units. Gerald instructed them in team building and in the use of the seven management and planning tools. He also served as a consultant to the Atlantic Fleet TQL teams as they began to work with their units.

In 1991, he joined the Office of the Under Secretary of the Navy's TQL Office as a technical advisor, researcher, and instructor. He is a member of the faculty responsible for training the Department of the Navy's TQL specialists and Senior Leaders Seminar instructors. He is a frequent guest speaker at TQL conferences.

Gerald is a member of the Deming Study Group in Washington, DC. In 1990 he was nominated and selected to Who's Who in the West.

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INTRODUCTION

More managers than ever before are focusing on quality as a way of increasing productivity, reducing costs, and meeting customer needs. These managers are beginning to understand the importance of continuously improving the quality of their services and products as a way of achieving these goals. Those who begin to learn about quality quickly become familiar with the names of Philip B. Crosby, W. Edwards Deming, and Joseph M. Juran--renowned quality experts--who have been carrying forth the message of quality for more than 30 years.

There has been a consistent demand for information about the unique approach of each of these experts. An early effort conducted at the Navy Personnel Research and Development Center (Houston, Shettel-Neuber, & Sheposh, 1986) addressed the suitability of applying the approaches of Crosby, Deming, and Juran to naval repair and maintenance facilities. The report identified statistical process control (SPC) as the primary focus.

Interest in the approaches of Crosby, Deming, and Juran continues. This report has been written to answer many of the questions that we and others associated with quality initiatives are asked. It addresses the approaches of Crosby, Deming, and Juran as comprehensive management philosophies aimed at long-term improvements and customer satisfaction through leadership.

This report is intended for individuals beginning their education in the field of quality. I provide a biographical sketch of the three experts, describe their definitions of quality and the basic principles underlying their approaches, and discuss similarities and differences between them. Finally, I describe the direction that the Department of the Navy has taken in its pursuit of quality and improved productivity.

THREE EXPERTS ON QUALITY

At an age when most people have retired, Philip B. Crosby, W. Edwards Deming, and Joseph M. Juran continue an untiring pace of work--conducting seminars, consulting with clients, and writing new texts. They have devoted their lives to helping organizations improve the quality of their products and services. Their influence is now worldwide and their accomplishments legendary.

W. Edwards Deming, senior of the three, continues a one-man show with his now-famous 4-day seminar aimed at awakening managers to the need for quality improvement. At 91, he continues to teach and consult both here and abroad. Joseph Juran, 87, has worked devotedly to establish his own institute, which provides education, training, and consulting in how to manage for quality. Philip B. Crosby, 65, has established a Quality College, which has trained more than 100,000 managers. In 1991 Crosby retired from the firm Philip Crosby Associates (PCA) and started a new company, Career IV, Inc., for the purpose of conducting seminars, writing books, and conducting a limited lecture tour.

CROSBY

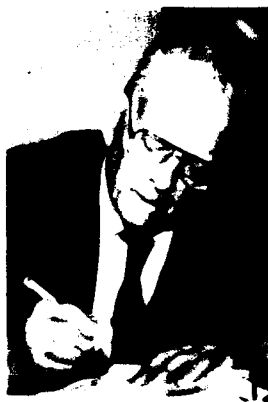


Philip B. Crosby is an internationally known quality expert. He is best known for popularizing the "Zero Defects" concept that originated in the United States at the Martin Marietta Corporation where Crosby worked during the 1960s.

Crosby, an engineer, began his career as a junior technician in a quality department, working his way up through that company and several others until eventually he became Director of Quality and Corporate Vice President of ITT Corporation, where he spent 14 years. In 1979, Crosby's book *Quality is Free* was published and became a best seller in the field of management. That same year, he established the consulting firm PCA and, with it, the Quality College. Crosby is also the author of *Leading* (1990); *Let's Talk Quality* (1989); *The Eternally Successful Organization* (1988); *Running Things: The Art of Making Things Happen* (1986); *Quality Without Tears: The Art of Hassle-free Management* (1984); and *The Art of Getting Your Own Sweet Way* (1972). Crosby's books have been translated into 10 languages.

In 1985, PCA went public, and, in 1989, merged with Alexander Proudfoot. The company has 350 employees working in 15 countries. It is now the world's largest management consulting and teaching firm.

DEMING



W. Edwards Deming holds a Ph.D. in physics, but is a statistician by experience. He is an educator, lecturer, author, and an internationally renowned consultant, best known for leading Japanese businesses on the course that has made them leaders in quality and productivity throughout the world. He has been called "The Father of the Third Wave of the Industrial Revolution" (*If Japan Can ... Why Can't We?* [NBC White Paper], 1980).

Deming began teaching engineering and physics in the 1920s, at the same time he began studying for his Ph.D. in physics and working summers at the Hawthorne Electric Plant in Chicago. In 1927, he worked for the U.S. Department of Agriculture where he met Walter Shewhart, who was developing techniques to bring industrial processes under statistical control. Deming studied Shewhart's theories, which became the basis of his own work years later.

Deming is author of *Out of the Crisis* (1986); *Quality, Productivity, and Competitive Position* (1982); *Sample Design in Business Research* (1960); *Statistical Adjustment of Data* (1943 & 1964); and *Theory of Sampling* (1950) as well as of numerous papers. As mentioned before, he is credited with having a major influence on Japan's economic recovery after the Second World War. In recognition of Deming, the Japanese Union of Scientists and Engineers established the Deming Prize, given to individuals and organizations who make distinguished contributions to improving the quality of their products or services.

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U. S. recognition of Deming's methods of quality improvement came late in 1980, after NBC aired a documentary entitled *If Japan Can ... Why Can't We?* The program focused national attention on the importance of quality in world competitiveness. This program gave Deming's quality leadership approach a great deal of

exposure, and he began to receive calls from corporations across the U.S. that wanted to hire him as a consultant. Deming continues as a consultant and also conducts seminars on quality leadership and productivity, and continues to travel to New York weekly to teach at Columbia University and New York University.

Deming is the recipient of many awards, including the Order of the Sacred Treasure of Japan and the Shewhart Medal from the American Society of Quality Control. He has been awarded doctorates *honoris causa* by several universities.

JURAN



Joseph M. Juran holds degrees in electrical engineering and law. He has worked as an engineer, industrial executive, government administrator, university professor, labor arbitrator, corporate director, and management consultant. Juran worked at the Hawthorne Electric Plant in Chicago in the 1920s (as did Deming) and also taught at New York University. He is also well known in Japan for

his contributions to the practice of total quality control after the Second World War. Juran's teachings led, in part, to Japan's economic growth and success.

Juran visited Japan in the early 1950s as a lecturer and consultant and taught the Japanese, among other things, about the Pareto principle, which he popularized as the principle of the "vital few and the trivial many." Juran is also known for the "Juran trilogy" and the concept of "managerial breakthrough."

Juran's published works and programs have been translated into 16 languages. He is the chief editor of *The Quality Control Handbook* (1988) and the author of the following books: *Juran on Leadership for Quality* (1989); *Juran on Planning for Quality* (1988); *Managerial Breakthrough* (1964); *Case Studies in Industrial Management* (1955); *Management of Inspection and Quality Control* (1945); and *Bureaucracy: A Challenge to Better Management* (1944). In 1979, Juran established the Juran Institute, Inc., in Wilton, Connecticut, where he conducted seminars and produced educational materials on quality. He is currently the Chairman Emeritus of the Juran Institute, serves on the Institute's Board of Directors, and continues to lecture and consult with organizations around the world.

Juran has received over 30 honorary awards and prizes. Among them is the Order of the Sacred Treasure of Japan. In recognition of his contributions, the Australian Organization for Quality Control established the Juran Medal in 1975.

QUALITY DEFINITIONS

CROSBY

To Crosby, quality means "conformance to requirements" (Crosby, 1979). Quality must be defined in measurable and clearly stated terms to help the organization take action based on tangible targets, rather than on hunch, experience, or opinions.

To Crosby, quality is either present or not present. There is no such thing as differing levels of quality. Management must measure quality by continually tracking the cost of doing things wrong. Crosby refers to this as the "price of nonconformance." To aid managers in tracking the cost of doing things wrong, he developed the following formula: Cost of Quality (COQ) = Price of Conformance (POC) + Price of Nonconformance (PONC). The POC refers to the cost of getting things done right the first time. PONC provides management with information

regarding the wasted cost and a "visible" indication of progress as the organization improves.

DEMING

Deming does not define quality in a single phrase. He asserts that the quality of any product or service can only be defined by the customer. Quality is a relative term that will change in meaning depending on the customer's needs. To meet or exceed the customer's needs, managers must understand the importance of consumer research, statistical theory, statistical thinking, and the application of statistical methods to processes. Definitions extracted from his writings reflect this emphasis on quantitative methods, the application of which results in products having (1) a predictable degree of uniformity resulting from reduced variability, (2) lower cost, and (3) suitability

for the market (Lowe & Mazzeo, 1986). In *Out of the Crisis*, he is cautious in defining quality and characterizes the difficulty of achieving it. "The difficulty in defining quality is to translate future needs of the user into measurable characteristics, so that a product can be designed and turned out to give satisfaction at a price that the user will pay" (Deming, 1986, p. 169).

JURAN

Juran defines quality as "fitness for use." He stresses a balance between product *features* and products *free from deficiencies*. As used by Juran, the word "product" refers to the *output* of any process, and that includes goods as well as services (Juran & Gryna, 1988).

By features, he does not mean luxury items (e.g., power windows) but technological properties of a product (e.g., fuel consumption of a vehicle) designed to meet the customer's needs. Service organizations also possess features, such as promptness of delivery or courtesy extended.

The second element of Juran's definition of quality addresses products free from deficiencies (e.g., errors in invoices, factory scrap, late deliveries). According to Juran, these failures make trouble for the customers and, as a consequence, they become dissatisfied.

Juran's definition of quality reflects his strong orientation to meeting customer's expectations. Anyone affected by the product is considered a customer, according to Juran. This group includes those who deal with the product during its developmental stages, the *internal customers*, and those who deal with the finished product, the *external customers*.

BASIC PRINCIPLES

CROSBY

The foundation of Crosby's approach is prevention. His approach to quality is best described by the following concepts: (1) "Do It Right the First Time"; (2) "Zero Defects" and "Zero Defects Day"; (3) the "Four Absolutes of Quality"; (4) the "Prevention Process"; (5) the "Quality Vaccine"; and (6) the "Six C's."

"Do It Right the First Time"

Crosby's approach focuses on doing things right the first time and every time. There is no place in his philosophy for differing levels of quality or categories of quality (e.g., high/low, good/poor). He believes there should be no reason for planning and investing in strategies that are designed in case something does not conform to requirements and goes wrong. He stresses that the way to manage quality is by prevention, not detection and testing. To Crosby, any product that falls within its design specifications is a quality product (Garvin & March, 1986).

Crosby addresses the need to change management's perception of and attitudes about quality. He has found it

is a common attitude among managers to believe that error is inevitable, it is a normal part of business life, and one needs to cope with it. He believes management creates most of its problems through its attitudes and practices in terms of what is rewarded and supported in an organization. For example, if adherence to schedule is reinforced over quality, then schedule will become the focus of the work.

"Zero Defects" and "Zero Defects Day"

The ultimate goal of his quality improvement process is "Zero Defects" or "defect-free" products and services. Contrary to what is generally believed, "Zero Defects" is not just a motivational slogan, but an attitude and commitment to prevention. "Zero Defects" does not mean that the product has to be perfect. It does mean that every individual in the organization is committed to meet the requirement the first time, every time, and that not meeting the requirement is not acceptable. To get everyone involved in the process of quality improvement, Crosby stresses individual conformance to requirements. To Crosby, when people are asked to "do it right the first time," requirements are the "it" (Crosby, 1987).

His approach provides for the establishment of a "Zero Defects Day," a day that provides a forum for management to reaffirm its commitment to quality and allows employees to make the same commitment.

"Four Absolutes of Quality"

Quality improvement begins with what Crosby calls the four absolutes of quality management, considered by him to be the core concepts of the quality improvement process. The four absolutes are:

1. *Quality is conformance to the requirements:* All the actions necessary to run an organization, produce a product and or service, and deal with customers must be met and agreed. If management wants people to "do it right the first time," they must clearly communicate what "it" is and help them achieve it through leadership, training, and fostering a climate of cooperation.

2. *The system of quality is prevention:* The system that produces quality is prevention (i.e., eliminating errors before they occur). To Crosby, training, discipline, example, and leadership produce prevention. Management must consciously commit themselves to a prevention-oriented work environment.

3. *The performance standard is "Zero Defects" ("Do it right the first time"):* The attitude of "close enough" is not tolerated in Crosby's approach. Errors are too costly to ignore. Leaders must help others in their pursuit of conforming to requirements by allocating resources for training, providing time, tools, etc., to all employees.

4. *The measurement of quality is the price of nonconformance:* Nonconformance is a management tool for diagnosing an organization's effectiveness and efficiency.

These absolutes help management focus on quality improvement and, more importantly, help them make the shift from what Crosby calls conventional wisdom (the idea that if quality goes up, so does the cost) to the idea that quality and costs are not in competition with each other. According to Crosby, as quality increases, cost decreases--thus, quality doesn't cost. This reasoning led to Crosby's famous phrase, "Quality is free, but it is not a gift" (Crosby, 1979).

To implement his quality improvement process, Crosby delineates a 14-step approach consisting of activities that are the responsibility of top management, but also involve workers (Figure 1). The 14 steps represent Crosby's techniques for managing quality improvement and communicating the four absolutes.

Crosby's 14 Steps	
1. Management commitment	8. Quality education
2. The quality improvement team	9. "Zero Defects Day"
3. Quality measurement	10. Goal setting
4. The cost of quality	11. Error-cause removal
5. Quality awareness	12. Recognition
6. Corrective action	13. Quality councils
7. Zero defects planning	14. "Do it over again"

Figure 1. Crosby's 14 steps (Crosby, 1987).

“Prevention Process”

Crosby's approach addresses prevention rather than inspection and correction of errors (Figure 2). He says that prevention involves thinking, planning, and analyzing processes to anticipate where errors could occur, and then taking action to keep them from occurring. To Crosby, problems usually arise because product or service requirements are either lacking or in error. His prevention process begins by establishing the product or service requirement, developing the product or service, gathering data, comparing the data to the requirement, and taking action on the result. Crosby suggests this is a continuing activity.

“Quality Vaccine”

Crosby sees problems as “bacteria of nonconformance” that must be “vaccinated” with “antibodies” to prevent problems (Crosby, 1984). He has formulated a “quality vaccine” that consists of three distinct management actions—*determination, education, and implementation*. Top management is responsible for continually administering the “vaccine.”

Determination surfaces when management sees the need to change and recognizes that change requires management action. *Education* is the process of providing all employees with the common language of quality, helping them to understand what their role is in the quality im-

provement process, as well as helping them to develop a knowledge base for preventing problems. The third action is *implementation*, which consists of the development of a plan, the assignment of resources, and the support of an environment consistent with a quality improvement philosophy. In this phase, management must lead by example and provide follow-up education.

“Six C's”

To Crosby, education is a multi-stage process that every organization must go through, a process he calls the “Six C's” (Crosby, 1984). The first stage, or “C,” is *comprehension*, which addresses the importance of understanding what is meant by quality. Comprehension must begin at the top and eventually include all employees. Without comprehension, quality improvement will not occur. The second “C” is *commitment*, which also must begin at the top and represents the stage when managers establish a quality policy. The third is *competence*; developing an education and training plan during this stage is critical to implementing the quality improvement process in a methodical way. The fourth “C” is *communication*; all efforts must be documented and success stories published so that complete understanding of quality by all people in the corporate culture is achieved. The fifth is *correction*, which focuses on prevention and performance. Finally, the sixth is *continuance*, which

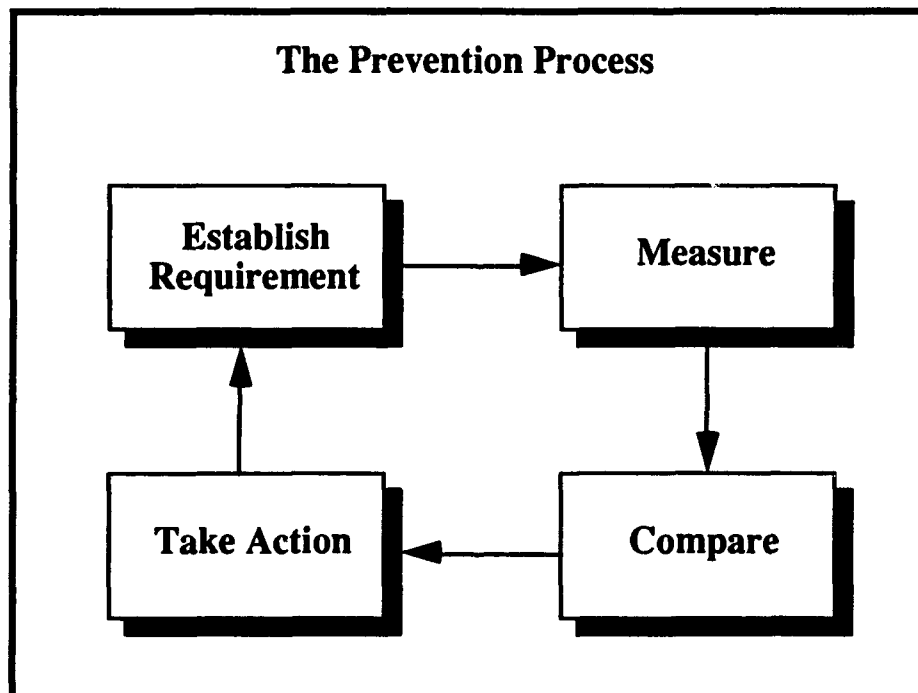


Figure 2. The prevention process (Crosby, 1987).

emphasizes that the process must become a way of life in the organization. Continuance is based on the fact that it is never cheaper or quicker to do anything right the second time, so quality must be integrated into all day-to-day operations (*Quality Process Improvement Management College* [course materials], 1987).

Summary

Crosby's main point is that quality is achieved by preventing defects and conforming to requirements. Requirements must be agreed upon and employees must know how to achieve them. The monetary cost of quality is the focus of measurement, and he developed a formula to help managers track this cost. This formula provides for continuously measuring the cost of waste versus the lower cost of doing things right the first time, which is his performance standard.

He urges activities (e.g., "Zero Defects Day") where management and employees reaffirm their commitment to quality. His training program focuses on helping managers develop an organizational culture that focuses on quality. The ultimate goal of his approach is to provide "defect-free" products and services to the customers.

DEMING

Deming takes a systems and leadership approach to quality. Concepts associated with his approach include (1) the "System of Profound Knowledge," (2) the "Plan-Do-Check-Act Cycle," (3) "Prevention by Process Improvement," (4) the "Chain Reaction for Quality Improvement," (5) "Common Cause and Special Cause Variation," (6) the "14 Points," and (7) the "Deadly" and "Dreadful Diseases."

"System of Profound Knowledge"

Understanding the concepts of profound knowledge is critical to understanding Deming's approach to quality. Deming states in his seminars that there is no substitute for knowledge. Hard work and best efforts are not the answer. Without profound knowledge, management action can cause ruination (Deming, 1989, revised 1991). The system of profound knowledge is made up of four interrelated parts: (1) theory of systems, (2) theory of variation, (3) theory of knowledge, and (4) knowledge of psychology.

Theory of Systems. "A system is a series of functions or activities... within an organization that work together for the aim of the organization" (Deming, 1989, revised 1991). He adds, "Without an aim, there is no system."

The components of a system (e.g., management style, employees, customers, environmental constraints, shareholders, training, recruitment) and its interrelationships to each other must be studied. Lack of appreciation of organizations as systems leads to fragmentation, people going in different directions unaware of the internal and external influences and interactions that affect their work.

Theory of Variation. Knowledge of statistical theory is essential to profound knowledge. Managers must be able to recognize a stable system and understand the concepts of special and common causes of variation. Failure to appreciate the difference will lead to frustration, increased variability, and higher costs (Deming, 1986). These adverse effects result from management taking action and responding to problems without knowing if the cause belongs to the system ("common") or if it is localized ("special"). Measurement of variation provides the means for predicting the behavior of a system.

Theory of Knowledge. The third part of profound knowledge addresses the way in which knowledge is advanced. The process of advancing knowledge can usually be described as a slow, continuous stream of tests and experiments, each designed to advance the state of knowledge in a particular field. Occasionally "break-throughs" occur that produce rapid advances in knowledge, but the general process is that of slow, incremental growth based upon experimentation, guided by theory.

Deming believes that managers should pursue goals similar to those of science (explain, predict, and control) to gain more knowledge about the systems and processes in their organizations. They will need to learn how to increase their knowledge of the processes for which they are responsible by participating in such "scientific" activities as formulating theories, developing hypotheses, designing and conducting experiments. They will need to know how to collect, analyze, interpret, and apply data derived from experimentation. A theory need not be complex, it may be as simple as stating (predicting) that one method of training may be more effective than another for learning certain skills.

Deming is critical of managers who look elsewhere for solutions (e.g., copying a remedy, adopting others' successful ideas). "An example is no help in management unless studied with the aid of theory. To copy an example of success, without understanding it with the aid of theory, may lead to disaster" (Deming, 1989, revised 1991). Theory advances knowledge and knowledge is obtained through use of the scientific method.

"To copy an example of success, without understanding it with the aid of theory, may lead to disaster."

A common "false start" encountered by organizations beginning to focus on quality is their failure to understand the importance of learning the theory of quality management. No two organizations are alike, each has different requirements and may require tailored applications of the theory.

Knowledge of Psychology. The fourth part of profound knowledge involves psychology, in particular the dynamics of people in the workplace, group or team performance, learning styles, and cultural change. Management needs to have knowledge of people and how they interact, of their individual needs, and of their working and learning styles. People are different from one another, and it is management's responsibility to be aware of those differences and use them to optimize performance.

The "Plan-Do-Check-Act Cycle"

Deming emphasizes continuous improvement and believes that it is management's obligation to constantly and forever improve the system of production and service. The concept of ongoing improvement is illustrated by the Shewhart cycle or the Plan-Do-Check-Act (PDCA) cycle (Figure 3).¹

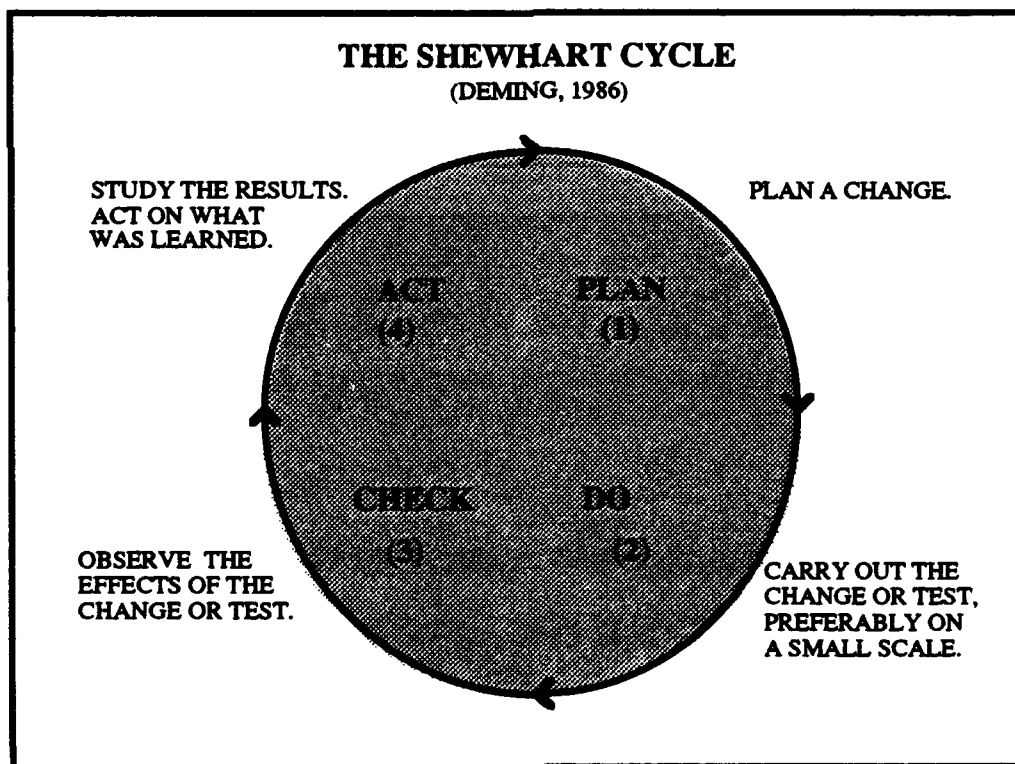


Figure 3. The Shewhart cycle as described by Deming (1986).

¹ Also known by the Japanese as the Deming cycle because it was Deming who first introduced it to the Japanese in the 1950s (Ishikawa & Lu, 1985). For an interpretation of the PDCA cycle, refer to Houston, A., & Dockstader, S. L. (December 1988). *A total quality management process improvement model* (NPRDC Tech. Rep. 89-3). San Diego, CA: Navy Personnel Research and Development Center.

“Prevention by Process Improvement”

Deming stresses that inspection at the end of the process is too late and too costly. His approach is a shift from detection to prevention (Figure 4). To Deming, the prevention approach to quality is achieved by process analysis, control, and improvement. A process is defined as any set of conditions, or set of causes, that work together to produce a given result. It is usually a blending of machines, methods, materials, and people (Figure 4).

Measurement is used to monitor processes and take action to minimize the possibility of producing unacceptable products or services to the customer.

Note that the size of the “process” box has been enlarged in the prevention approach and contains “causes” for a product or service. The diagram is presented this way to emphasize the point that quality results from studying and changing the process, not inspecting the final product.

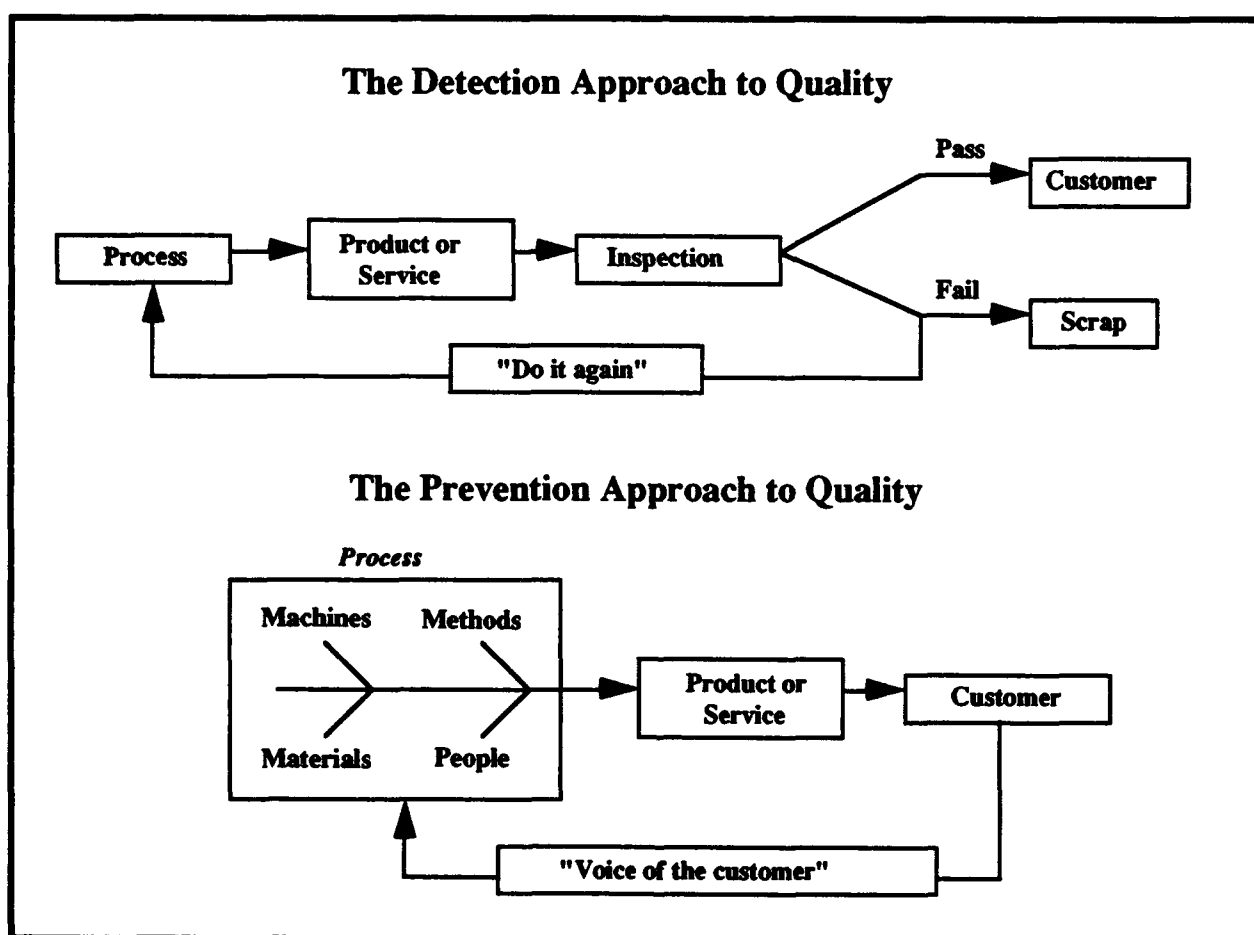


Figure 4. The detection versus the prevention approach to quality (Navy Personnel Research and Development Center, TQL Implementation Seminar [course materials], 1988).

“Chain Reaction for Quality Improvement”

Deming’s philosophy can best be depicted by what he calls the chain reaction for quality improvement (Figure 5) (Deming, 1986, p. 3). By improving quality, costs decrease and productivity improves. As a result, there is a greater potential for an increased market share.

To address the first box in the chain reaction (improve quality), management must adopt the 14 principles of management (Figure 6) and understand the statistical approach to process improvement. To appreciate fully the meaning of improving quality in Deming’s chain reaction, an understanding of the concept of variation is required.

“Common Cause and Special Cause Variation”

When Deming describes quality, he talks about products that possess a predictable degree of “uniformity,” suited to the end-users at a price that they can pay (Deming, 1986, p. 178). McConnell refers to it as “a predictable degree of variation” (McConnell, 1987). Deming says that there’s no such thing as two of a kind, since variation is inherent in everything we do. No two services offered are identical. So, to produce quality, you must produce outcomes that are predictably uniform as well as satisfactory from a customer’s perception.

Deming has labeled sources of variation as *common cause* and *special cause*. He talks about them in terms of *who* is responsible for taking action. Common causes of variation exist because of the system or the way the system is managed. These causes are beyond the reach of the

workers and only those who manage or control the system are responsible for them. Most process problems in an organization, *the common causes of variation*, are correctable only through managerial action. Examples of common cause variation are incoming materials not suited to the requirements, poor instructions, poor supervision, and poor design (Deming, 1986).

There are also *special causes of variation*. Special causes of variation are localized. They are not part of the overall system. They are exceptions or abnormalities. They deserve attention by those who are close to them. Usually the workers or their immediate supervisor can identify and remove special causes.

Tribus says, “It is management’s responsibility to work *on* the system and it is the worker’s responsibility to work *in* the system” (1988). Supervisors and workers must cooperate with each other to remove the special causes so that management can work on the system and begin the transformation (the adoption of the 14 points). This transformation is not easy. As Deming says, “Everyone doing his best is not the answer. It is necessary that people know what to do.” He adds, “The responsibility for change rests on management. The first step is to learn how to change” (Deming, 1982, p. ii).

The best way to identify and monitor special and common causes of variation is by using Walter Shewhart’s control charts (McConnell, 1987). (Shewhart’s discoveries and contributions are far beyond the scope of this report. Suggested readings on control charts appear in the reference list.)

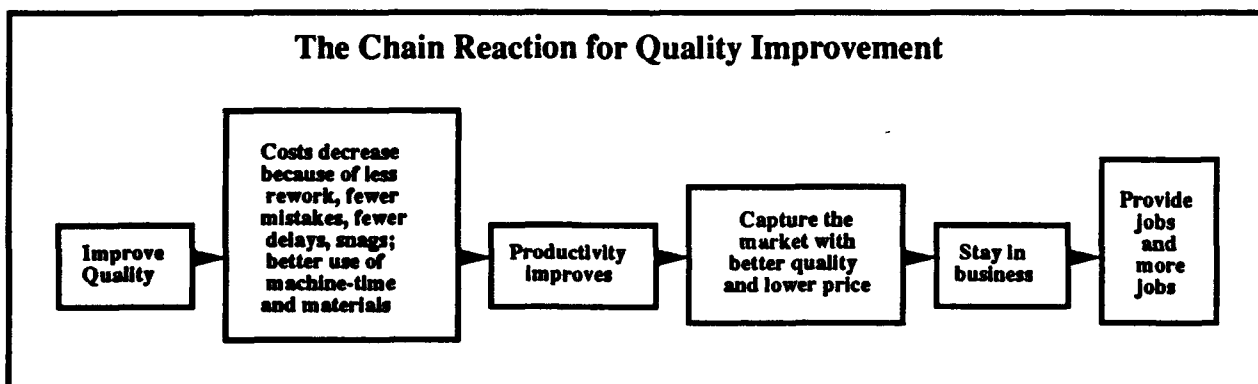


Figure 5. Deming’s chain reaction for quality improvement (Deming, 1986).

"14 Points"

According to Deming, the "14 Points" or "obligations" (Figure 6) apply anywhere, in any organization, regardless of size or type of business. These points provide the basis for initiating and sustaining an organizational transformation that focuses on customer satisfaction through quality. These obligations are management's responsibility and they cannot be delegated. Deming says, "Adoption and action on the 14 points are a signal that the management intend to stay in business and aim to protect investors and jobs" (Deming, 1986, p. 23). To adopt the 14 points, management needs to put aside short-term thinking for the long-term good of the company so that they can be in business tomorrow.

The 14 points have undergone revision by Deming to help people understand his observations. However, the essence of each point has remained essentially the same from one version to the next.

"Deadly" and "Dreadful Diseases"

There are many roadblocks to institutionalizing the transformation. Deming categorizes them as "deadly diseases" and "dreadful diseases" (Figure 7). "Deadly diseases" afflict most companies in the Western World.

The cure for deadly diseases is not easy. It requires a complete change of management style. The dreadful diseases are management practices that are harmful, but, in Deming's view, are easier to cure. To remedy the diseases, Deming "prescribes" his 14 points or obligations of top management.

Summary

Deming defines quality in terms of current and future needs of the customer. He places emphasis on statistical thinking and statistical methods. An understanding of profound knowledge (e.g., systems theory) is essential to his approach to quality.

He gives management the responsibility of adopting the 14 points and of leading by example, but does not provide a step-by-step approach on how to implement these roles and responsibilities.

He views the organization as a system and advocates using a scientific method to optimize the system.

Deming's 14 Points

1. Create constancy of purpose toward improvement of product and service.
2. Adopt the new philosophy.
3. Cease dependence on inspection to achieve quality.
4. End the practice of awarding business on the basis of price tag alone.
5. Improve constantly and forever the system of production and service.
6. Institute training on the job.
7. Institute leadership.
8. Drive out fear.
9. Break down barriers between departments.
10. Eliminate slogans, exhortations, and targets for the work force.
11. Eliminate numerical quotas for the work force and numerical goals for management.
12. Remove barriers that rob people of pride of workmanship. Eliminate the annual rating or merit system.
13. Institute a vigorous program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation.

Figure 6. Deming's 14 Points (Deming, 1986).

The Deadly Diseases

1. Lack of constancy of purpose.
2. Emphasis on short-term profits, short-term thinking.
3. Evaluation of performance, merit rating, or annual review.
4. Mobility of management; job hopping.
5. Management by use of visible figures only.
6. Excessive medical costs.
7. Excessive costs of liability.

The Dreadful Diseases or Obstacles

1. Search for examples of how to solve problems of quality.
2. Creative accounting.
3. Purchasing standards that assume a certain percentage of defects.
4. Management's delegation of its responsibilities to others.
5. The supposition that problems are the fault of the work force.
6. The attempt to safeguard quality by inspecting goods already produced.
7. False starts: modest, ad hoc efforts to bring about change.
8. Hope for instant pudding.
9. The supposition that automation will transform industry.
10. The supposition that it is only necessary to meet specifications.

Figure 7. The "deadly" and "dreadful diseases" (Deming, 1986, Chapter 3).

JURAN

Juran proposes a strategic and structured (i.e., project-by-project) approach to achieving quality. Concepts he developed to support his philosophy include (1) the "Spiral of Progress in Quality," (2) the "Breakthrough Sequence," (3) the "Project-by-Project Approach," (4) the "Juran Trilogy," and (5) the principle of the "Vital Few and Trivial Many."

The "Spiral of Progress in Quality"

Juran stresses that "any organization produces and distributes its products through a series of specialized activities carried out by specialized departments." These activities (actions) are depicted by the "spiral of progress in quality" (Juran and Gryna, 1988, p. 2.4). The spiral shows actions necessary before a product or service can be introduced to the market (Figure 8).

"Each specialized department in the spiral [e.g., customer service, marketing, purchasing] is given the responsibility to carry out its assigned special function. In addition, each specialized department is also assigned a share of the responsibility of carrying out certain com-

pany-wide functions such as human relations, finance, and quality" (Juran & Gryna, 1988, p. 2.4). Quality results from the interrelationship of all departments within the spiral. Juran talks about "quality function" to describe activities through which the departments around the spiral can attain quality.

Quality improvement projects are carried out throughout the organization. The approach includes:

1. Identifying the activities that could meet the company's goals of fitness for use.
2. Assigning the activities to the various departments and organizations around the spiral.
3. Providing the facilities and tools needed to conduct these activities.
4. Conducting the assigned activities within the designated departments.
5. Ensuring that these activities are properly carried out.
6. Coordinating the departmental activities.

“Breakthrough Sequence”

Juran's philosophy addresses improvement and innovation in terms of “breakthrough.” He defines breakthrough as a “dynamic, decisive movement to new, higher levels of performance” (Juran, 1964). His breakthrough sequence involves activities that, if carried out properly, will result in improvements in quality and will eventually result in unprecedented performance that will help the organization launch innovative products. Breakthroughs can lead to: (1) attainment of quality leadership, (2) solution to an excessive number of field problems, and (3) improvement of the organization's public image.

There are barriers that affect opportunities for breakthrough. As with any other change, breakthrough can be resisted by managers who traditionally concentrate on control. Through control, managers maintain the present levels of performance or prevent adverse change. Control activities, such as problem solving, have a short-term focus; they are necessary to hold on to gains, but will not lead to improvement and innovation. Breakthrough activities are needed to achieve higher levels of performance and innovation and to exceed customer satisfaction.

According to Juran, breakthrough and control are part of a continuing cycle of gains and plateaus in performance, and he considers that all managerial activity is directed at either breakthrough or control (Juran, 1964). According to Juran, all breakthroughs follow the same sequence:

1. Policy making.
2. Setting objectives for breakthrough.
3. Breakthrough in attitudes.
4. Use of Pareto principle.
5. Organizing for breakthrough in knowledge.
6. Creation of steering arm.
7. Creation of diagnostic arm.
8. Diagnosis.
9. Breakthrough in cultural pattern.
10. Transition to the new level.

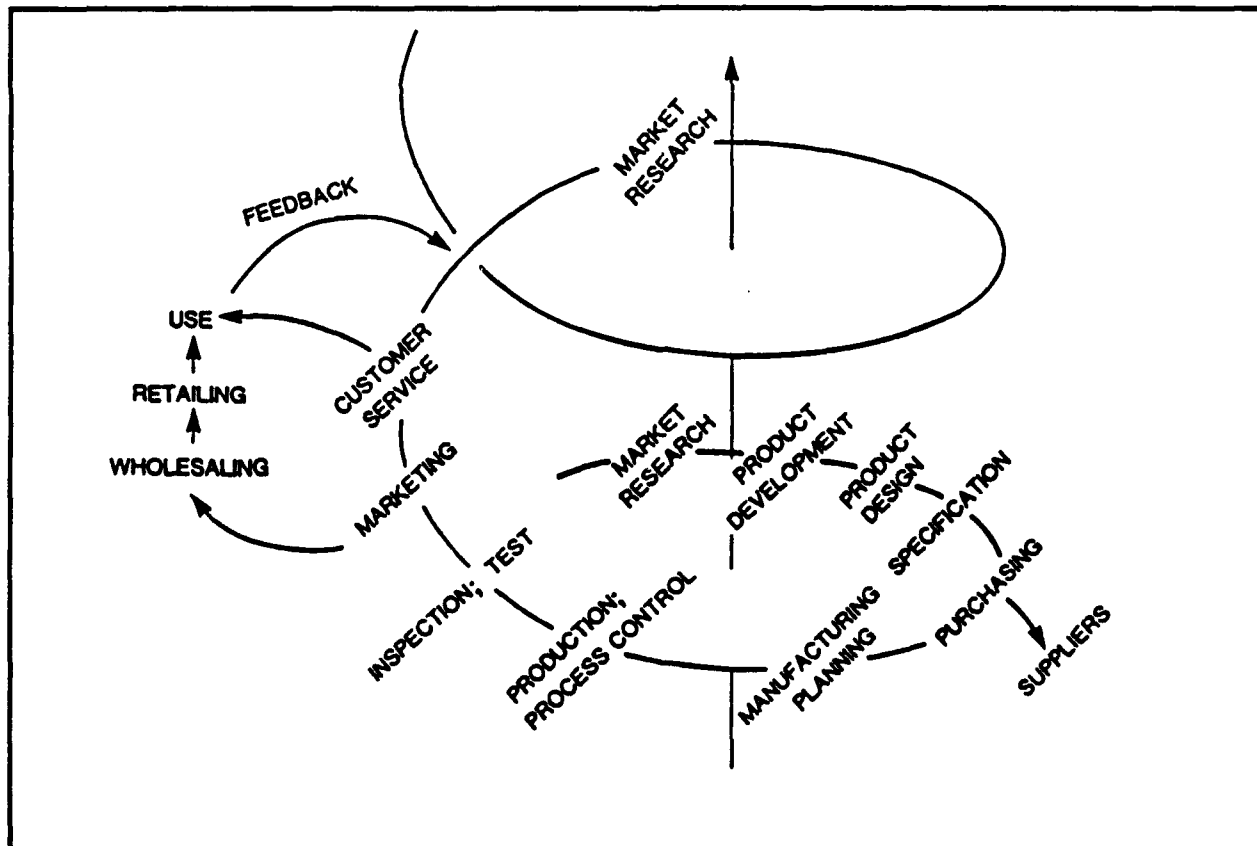


Figure 8. The “spiral of progress in quality” (Juran & Gryna, 1988).

"Project-by-Project Approach"

The quality improvement methodology, as depicted by Juran, requires project-by-project implementation. Two kinds of teams are formed, the *steering arm* and the *diagnostic arm*, to work on analyzing problems (Figure 9). A committee of managers is formed to solicit project nominations from all employees, to select that year's projects, and to appoint teams to address each one. Typically, large numbers of project teams must be formed, depending on how many projects have been selected. His approach requires that members of the team develop skills in team leadership and team participation and acquire knowledge of problem-solving tools. Also, all employees need to participate in the improvement process and have the skills needed to make improvements.

The main thrust of these teams is to solve problems, but Juran distinguishes between "putting patches" on problems and finding and removing the causes of problems. He calls the process of analyzing problems the

"journey from symptom to cause." Examination of the symptom must be the starting point of the action team. The symptom is the evidence that something is wrong. Once the symptom has been identified, the objective of the team is to come up with a solution. However, the members will first need to discover the cause.

Juran developed two "journeys" to describe how the teams interact with each other in this process--the journey from symptom to cause, which he named the *diagnostic journey*, and the journey from cause to remedy, called the *remedial journey* (Juran & Gryna, 1988). Both journeys are different in purpose and require teams of people from different levels and departments (e.g., first-line supervisors, customer service) within the organization with different skills.

The teams' outcomes are documented and presented to the rest of the organization in an annual audit. The process of soliciting nominations for next year's projects is then repeated.

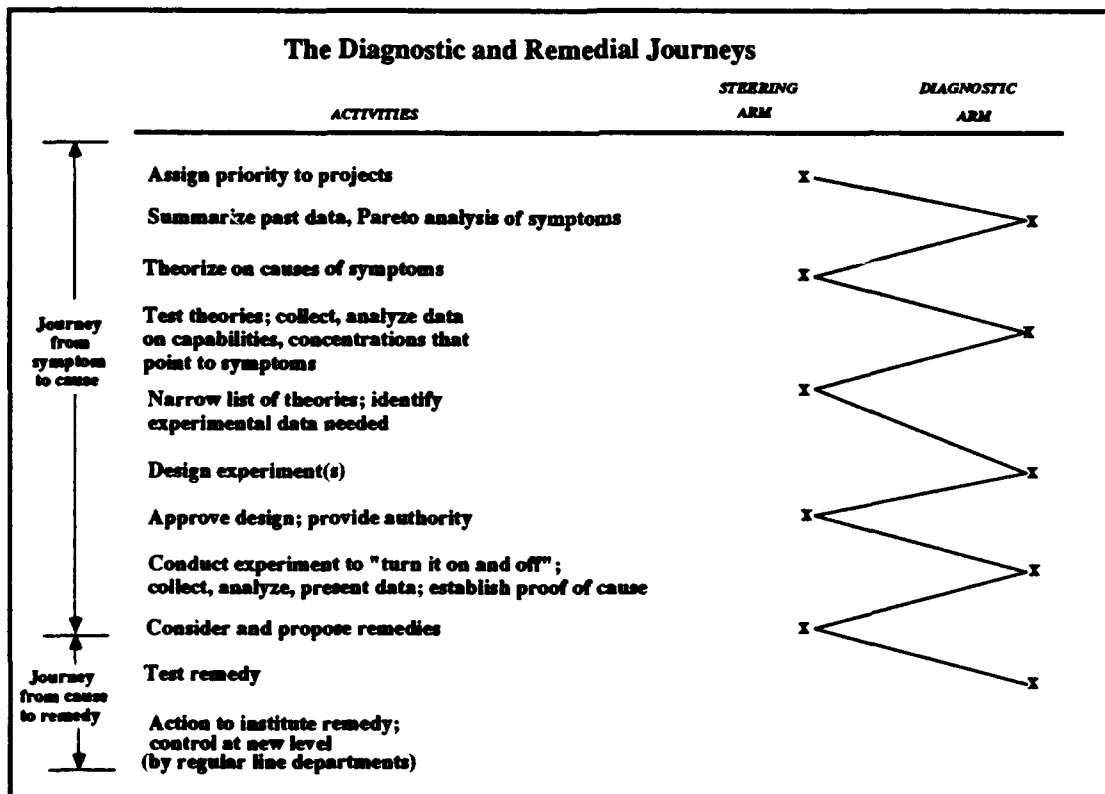


Figure 9. The diagnostic and remedial journeys (Juran, 1988).

The "Juran Trilogy"

The "Juran trilogy" provides a systematic approach to carrying out Juran's methodology for managing for quality. Essential to implementation, however, is active leadership, starting at the top.

This trilogy (Figure 10) states that management for quality consists of three interrelated quality-oriented processes -- quality planning, quality control, and quality improvement (Juran, 1986). *Quality planning* involves developing a process that will achieve the established goals. People working in the planning phase are responsible for determining who their customers are and identifying customer needs and expectations. *Quality control* is concerned with holding onto gains and not letting waste increase. The control process addresses the sporadic spikes in variation; if necessary, the people working in this process create teams to determine the causes of any abnormal variation in the process. Those involved in the *quality improvement* process are concerned with lowering

the cost of poor quality in existing processes, but, more importantly, are responsible for using the lessons learned for seeking innovative ways to achieve better levels of performance. In this respect, Juran's approach addresses continuous improvement.

Each process in the trilogy (planning, control, and improvement) is "universal" (inherent in organizations focusing on quality). Relevant activities include identifying customers, establishing measurements, and diagnosing causes. Juran compares the activities of the trilogy with those of financial operations. Money is the language of management and, in his terms, quality planning is analogous to budgeting, quality control to cost control, and quality improvement to cost reduction.

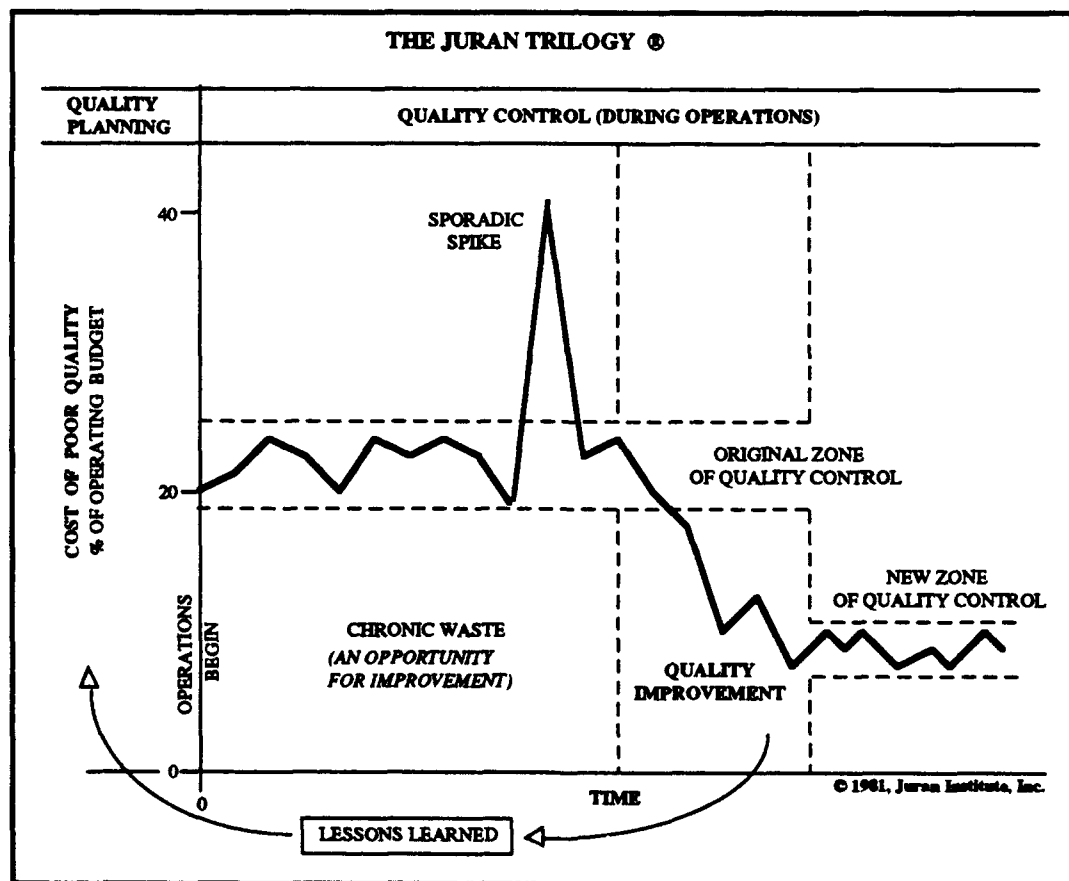


Figure 10. The "Juran trilogy" (Juran, 1981).

The "Vital Few and the Trivial Many"

Because Juran emphasizes prioritization of problems to be solved, the Pareto diagram is an especially useful tool to him. The diagram is based upon the principle developed in 1897 by the Italian economist Vilfredo Pareto. Pareto conducted studies of wealth distribution. He found that the vast majority of wealth in his society was held by a remarkably small percentage of the population. In general, the Pareto principle states that a few factors account for the largest percentage of a total.

Juran applied this concept to the industrial world to classify problems of quality (Figure 11). According to Juran, most of the cost of poor quality can be attributed to a very small number of causes called "the vital few." The other defects, called the "trivial many" and, lately, the "useful many," can be ignored for a time.

The Pareto diagram depicts columns arranged in descending order. The diagram in Figure 11 illustrates causes from many sources of variation. According to this graph, one should concentrate on cause "A" first because it is responsible for most of the defects and will result in the biggest payoff (Ishikawa, 1982). It should be noted, however, that frequency should not be the only characteristic to consider when beginning a Pareto analysis. Sometimes frequently occurring defects are not the most serious, and common sense needs to prevail in those situations when selecting initial causes for improvement.

Summary

The "project-by-project" approach is at the heart of Juran's philosophy. Using the concepts of the "spiral of progress" and the "breakthrough sequence," managers are able to target and improve specific areas.

Quality is defined by fitness for use and customer requirements. As with Crosby, the monetary cost of quality is the focus of measurement. He puts emphasis on company-wide goals and the deployment of specific goals. Juran targets training toward quality management practices and problem-solving techniques. His approach focuses on quality planning, quality control, and quality improvement processes as a way to manage for quality.

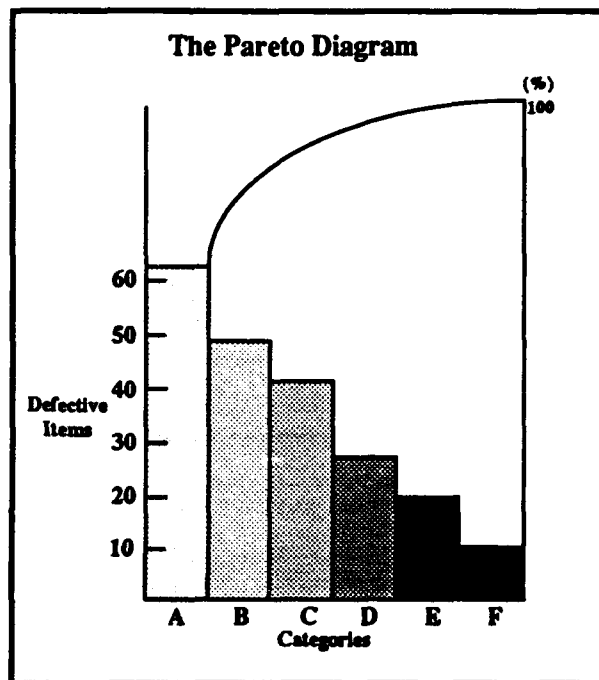


Figure 11. The Pareto diagram.

THE THREE APPROACHES: SIMILARITIES

Crosby, Deming, and Juran agree that it is management's responsibility to establish an organizational culture in which commitment to quality is the main focus. The mission of the organization must be clear to everyone, and every management action must lead to fulfillment of that mission. This culture should be characterized by commitment from the top of the organization. They agree that continuous education and training at all levels is necessary to foster a common language of quality and to develop employee skills and knowledge. Effective communication, cooperation, and teamwork throughout the organization are essential.

These experts agree that more than 85 percent of all problems associated with quality can be attributed to management policy or action. This means that management action is required to achieve improvements.

They also agree that the pursuit of customer-focused quality is a long-term process that will not produce results overnight. The improvements will be evident over time in terms of reduced costs, but, more importantly, organizations will eventually be able to anticipate and prevent problems.

They do not view improvements in terms of final products and agree that current inspection methods to achieve quality are not effective in producing a quality product at an affordable price. They say that there are some processes where inspection will always be required (e.g., for reasons of safety such as flying an airplane after conducting an overhaul), but that it is important to eliminate inspection as a means to achieving quality. They agree that cost and quality are not in competition with one another.

The three experts distinguish clearly between internal and external customers, and all support the practice of involving the suppliers in the quality effort. It is impossible to achieve quality when products or services provided by suppliers are inferior. These approaches also require the use of measurement and problem-solving techniques, but the emphasis on their use varies.

The approaches of Crosby, Deming, and Juran do not represent "programs" in the usual sense of the word; they

The approaches of Crosby, Deming, and Juran do not represent "programs" in the usual sense of the word; they do not have starting and ending dates.

do not have starting and ending dates. These are management philosophies aimed at long-term improvements through adoption of strategic planning for quality.

These three philosophies have been implemented over the years in various organizations in different countries. As philosophies they go beyond the economic concerns of an organization and address an organization's employees as well. They give high priority to pride in workmanship, education, and the work environment as well as to team building, teamwork, cooperation, and participation, all essential to cultural change. Figure 12 summarizes these similarities in list form.

Similarities

- Top management support and commitment are essential.
- Education and training must be continuous.
- Measurement is critical.
- Improvements are not viewed in terms of final products.
- Most problems associated with quality can be attributed to management policy or action.
- Implementation is applicable to any organization.
- Post-production inspection needs to be minimized.
- Effective communication and teamwork at all levels are essential.
- Managers need to provide workers with the means to do a good job.
- There are no shortcuts to quality.
- Suppliers must be involved in the quality effort.
- The pursuit of quality must be a continuous effort.

Figure 12. Similarities between the approaches of Crosby, Deming, and Juran.

THE THREE APPROACHES: DIFFERENCES

There are a number of differences between the three approaches. Differences affecting use of measurement, goal setting, supplier relationships, and leadership activities are discussed here.

USE OF MEASUREMENT

Crosby, Deming, and Juran recognize measurement as important to quality improvement efforts, but they use it in different ways. Both Crosby and Juran view the cost of quality as the focus of measurement. Cost is measurable in terms of dollars, and, for them, money is the language of management. Success of quality efforts is ultimately measured by meeting customer requirements, but Crosby and Juran use the reduction in cost as an indicator of the effectiveness and efficiency of the process used to meet customer requirements. Juran considers that the cost of poor quality is a key factor because it represents how much the organization is losing and how much it is spending on scrap and rework. Nevertheless, he acknowledges the fact that there are other equally important factors to measure, such as how the organization compares with the competition and how customers perceive quality. Deming does not use the cost of quality as a focus of measurement. He considers that the "unknown" costs, such as the impact of the loss of a customer, are far more important than "visible" ones. To Deming, measuring and

meeting customer needs and "expectations" about a product or service are paramount to implementing quality improvements.

Deming gives greater emphasis than do his counterparts to quantitative methods and statistical methods as a means of analyzing and improving the production process. He uses measurements of process variation to determine whether processes are stable and capable.

GOAL SETTING

To Crosby, the ultimate goal should be "defect-free" products and services, but he stresses that intermediate goals should be set as well to help organizations focus their efforts on becoming "defect-free." To him, a quality product or service results when the process has consistently produced something that falls within specification limits. Deming, on the other hand, considers that being within specifications is just the first step to continuous process improvement (Figure 13). He advocates reducing process variation on a continuing basis to improve quality. Conforming to specifications is not enough, he says; worse, yet, it ensures the status quo.

Figure 14 summarizes all of the important differences between the approaches of Crosby, Deming, and Juran.

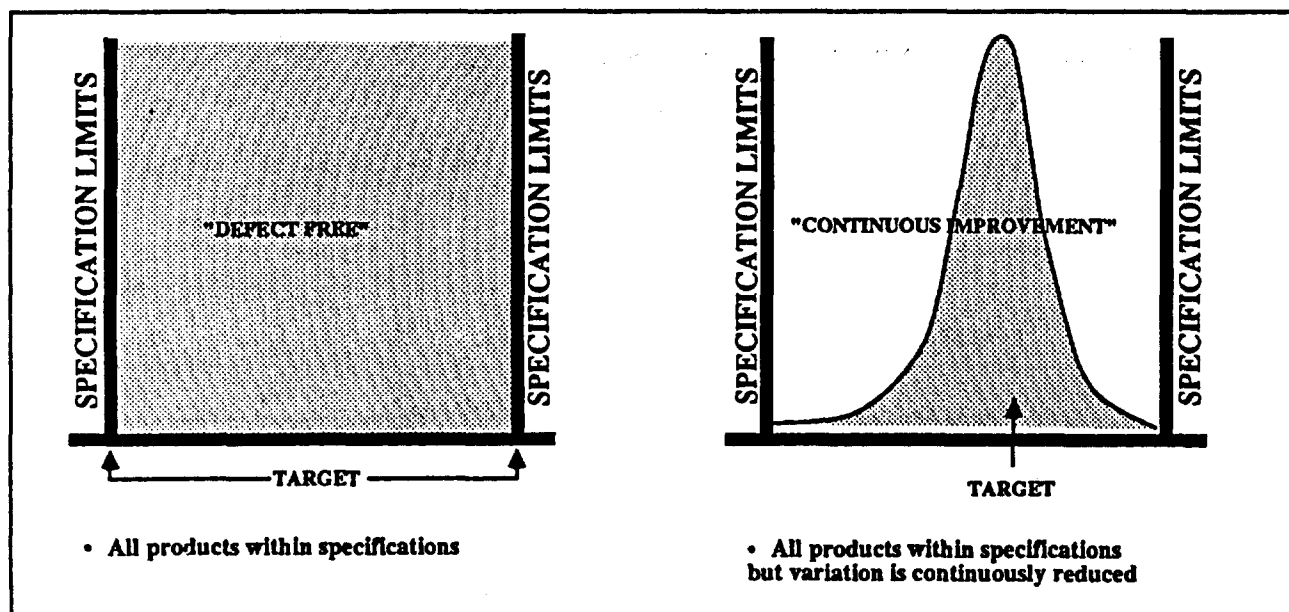


Figure 13. Differences between the "defect-free" and continuous improvement approaches to quality.

DEFINITION OF QUALITY			
	CROSBY	DEMING	JURAN
Defined by conformance to requirements.	X		
Defined by fitness for use and customer requirements.			X
Defined by the current and future needs of the customer.		X	
USE OF MEASUREMENT			
Views the monetary cost of quality as the focus of measurement.	X		X
Places emphasis on statistical thinking and statistical methods.		X	X
GOAL SETTING			
"Defect-free" products and services are the ultimate goal. Stresses individual conformance to requirements.	X		
Puts emphasis on company-wide goals and the deployment of goals.			X
Opposes the use of goals and quotas to manage work.		X	
SUPPLIER RELATIONSHIPS			
Favors the practice of reducing the number of suppliers.	X		X
Favors the practice of using a single supplier when possible.		X	
LEADERSHIP ACTIVITIES			
Urges the creation of an activity where management and employees reaffirm their commitment to quality.	X		X
Defines leadership roles and responsibilities but does not provide a "cookbook" approach to implementation.		X	
TRAINING			
Targets training to help managers develop a new organizational culture.	X		
Targets training toward quality management practices and problem-solving techniques.			X
Targets training towards leadership practices. Addresses the need for education and training for enhancing knowledge and developing skills.		X	
QUALITY IMPROVEMENT			
Emphasizes prevention to meet specifications.	X		
Uses three quality-oriented processes (planning, control, and improvement) to achieve improvements.			X
Views the organization as a system and applies the scientific method to optimize the system. Uses statistical methods to monitor variation.		X	

Figure 14. Differences between the approaches of Crosby, Deming, and Juran.

Deming also opposes the use of numerical goals and quotas to manage work. He thinks that individual goals are necessary to help people in their personal and professional lives, but numerical goals imposed from top management can have negative effects on both quality of products and individual and team morale--a certainty if there is no plan to achieve the goals or tools by which to reach them.

Juran sees a need for written objectives for employees, with a plan for reaching them. He addresses quality-related goals and company-wide objectives, but more important to him is the deployment of goals throughout the organization. Strategic goals need to be deployed to all divisions and sections of the organization, and more specific goals need to be deployed to people so that they know what to do.

SUPPLIER RELATIONSHIPS

The three advocates view the role of suppliers differently. Deming favors the practice of working with a single supplier, where feasible, to reduce variability of incoming materials, and states that this practice should be built on a long-term relationship of trust and understanding between supplier and purchaser. In this way, suppliers can produce materials that do a better job of fulfilling the needs of the organization. To maintain long-term contracts, suppliers will be more likely to improve their own processes to provide better products or services.

Crosby and Juran recognize some of the advantages of single suppliers, but they take a more conservative view and simply advocate reducing the number of suppliers. Crosby and Juran consider it important to have different suppliers for the same product when the product is a critical one. That way, the organization will not suffer because of strikes, accidents, or other problems beset by suppliers. Deming recognizes the possibilities of strikes, but admits that customers can receive products and services from alternative suppliers in such cases (Walton, 1986).

LEADERSHIP COMMITMENT

Although Crosby, Deming, and Juran acknowledge and agree that top management support, involvement, and commitment are essential for carrying out any quality-focused efforts, each emphasizes leader participation differently.

Crosby describes the "Zero Defects Day" as the time when management reaffirms its commitment to quality and communicates it to all employees. Similarly, Juran has a vehicle for involving top management. Juran's annual quality program is used by managers to communicate to all employees management's commitment to quality improvement. Managers' decisions and actions must be oriented to establishing a quality council, deploying goals, providing resources, and serving on quality councils and quality improvement teams.

Crosby describes the "Zero Defects Day" as the time when management reaffirms its commitment to quality and communicates it to all employees.

Although Deming acknowledges that top management commitment is imperative, he does not describe a program for accomplishing it. What works in one organization might not work in another. He affirms the need for management's commitment, but it is the responsibility of top management to show its commitment through leadership. Deming is specific, however, about the leaders' roles and responsibilities. As described by Deming, the aim of leadership is not to point fingers at individuals or to keep records of failures. To him, the leader's new job is to remove barriers and create a culture that values helping others to do a better job and to feel pride in workmanship (Deming, 1986). Leaders must lead by example, not by cheerleading. They must be coaches who help to improve the system of which they and their employees are a part.

SUMMARY

CROSBY

One of Crosby's strengths is his emphasis on transforming the culture of the organization. He provides a structured roadmap for attaining management commitment. He advocates individual commitment to quality at each level of the organization. Crosby provides education on the concepts of quality management, but realizes that

each organization must create its own quality improvement process plan. His approach is effective in transmitting the need to change attitudes and behaviors and has been successful in getting organizations started--one reason why Crosby appeals to many managers. Second, Crosby has a structured training program for managers that is taught at the Quality College. Many managers

generally find this approach easy to subscribe to and therefore choose to begin quality improvement using Crosby's approach. His approach emphasizes measuring the cost of doing things wrong versus the cost of doing things right the first time and does not emphasize a statistical basis for reduction of variation. As a result, organizations that do not focus on statistical methods may not be able to achieve improvements beyond initial cost reductions.

According to Andrea Gabor, author of *The Man Who Discovered Quality*, "Until recently (1990), Crosby downplayed the role of statistics. After Deming's popularity gave new credence to the importance of variation control in the late 1980s, Crosby is said to have begun teaching more of the subject at his seminars (Gabor, 1990, pp. 196-197)." In fact, Crosby founded Integrity Systems, Inc., a subsidiary of PCA, to provide clients with training packages in statistical process control.

Crosby advocates programs such as "Zero Defects Day," which has been widely misunderstood and viewed by some critics as merely a motivational program with only short-term benefits. Again, "Zero Defects Day" is intended to be a time when management reaffirms its commitment to quality.

DEMING

One of the main strengths of the Deming's philosophy is his view of organizations as systems and the use of statistical thinking to understand how systems function. The application of the PDCA cycle and quantitative methods to analysis and reduction of variation in all work processes is another important contribution, as is the distinction he makes between special and common causes of variation.

Most importantly, however, Deming stresses that management and leadership issues need to be addressed to create quality in products and services. The history of quality efforts in this country has taught us that to effect major changes in business, it is imperative to create an organizational culture dedicated to quality. This can only be achieved through changing the attitudes of top leadership. Deming's approach emphasizes leadership responsibilities, and he provides leaders with the 14 Points.

Although Deming stresses the adoption of his 14 management principles as the roadmap for change, he does not provide a sequenced implementation plan. Such a plan makes little sense in terms of his theory, but most managers are not taught to use theory. Consequently, they

are frustrated when they do not find a prescribed "linear sequence" of activities that can serve as a "cookbook" to success.

Deming's approach is associated with the application of SPC. He says that a knowledge of statistics is necessary, but not sufficient. The use of statistics is just one aspect of his broad management philosophy. Nevertheless, there are some who believe that by applying SPC they are implementing the Deming philosophy.

Finally, the application of the PDCA cycle is seen by many as a problem-solving tool instead of a means to *continuous* process improvement. Typically, any problem in understanding the power of the PDCA cycle can be tracked back to a lack of understanding about this essential difference. As described by Deming, problem solving is similar to "putting out a fire," that is, removing problems to put the process right back where it was, but that such action does not make the process better (an insight of Juran years ago; see Deming, 1986, p. 51).

JURAN

Juran has developed an approach in which problems are thought of as projects, and all improvements can be made project by project. Juran advocates the annual formation of teams to analyze problems and find solutions to them. His approach has been successful in organizations in which upper management has been heavily involved and has led the effort. Like Deming, he also emphasizes the use of graphics and statistical methods. Juran has devoted more than 300 pages in his *Quality Control Handbook* (1988) to statistical methods, and he views them as essential tools.

Juran's project-by-project approach is effective since it helps to focus improvement on specific areas. This approach can provide short-term results within the framework of a long-term strategy. This approach also builds teamwork and communication in the organization. Although emphasis is on projects, Juran ultimately provides a systems approach to quality through the spiral of progress, which links all of the functions necessary to launch a product or service.

One of the processes addressed by the "Juran trilogy" concerns problem solving and removal of problem causes. If managers give emphasis to this aspect of the trilogy, project teams then become firefighters instead of teams working toward prevention and process improvement. When upper management doesn't focus on the planning process of the trilogy, they are not able to prevent new

problems from occurring and are not able to initiate continuous improvement and strategically direct the course of the organization.

The setting of broad improvement goals by management could lead the organization to fall back into the

practice of managing by objectives. The "trilogy" approach is only as good as the managers who are trying to optimize the system (e.g., selecting the projects, priorities, and goals).

CONCLUSIONS

Managers involved in helping their organizations improve quality are frequently puzzled over which approach to use. Some organizations adopt an eclectic approach using components of the three philosophies and combining what they consider to be the best from the best. Other organizations select either the Crosby, Deming, or Juran approach and remain loyal to it; all their education, training, and implementation efforts reflect support for that one approach. There are organizations that switch in midstream (e.g., begin with Crosby, move to Juran, and then move to Deming). These organizations expect dramatic improvements in a short period of time and their obsession with immediate results forces them to try different approaches on a trial-and-error basis, without thought to a long-term strategy.

The key to successful implementation of quality principles and methods is tied to leadership. In fact, lack of management and leadership commitment is considered by Crosby to be the number one cause of quality improvement failure. According to Juran, every successful quality revolution has included the active participation of upper management. There are no exceptions. Deming agrees.

He says the transformation is top management's job and it cannot be delegated.

The key to successful implementation of quality principles and methods is tied to leadership.

Quality is not a quick fix to address management problems. It is not a program, but a transformation. As part of this effort, top managers must recognize the need for assessment, strategic planning, and the development of a long-term, integrated organization-wide approach. Leadership is needed to establish policies defining the positions the organization will take in regard to quality. Leadership is also needed to cultivate a customer orientation and provide all employees with ongoing education and training. These arguments notwithstanding, success or failure will rest upon the correct assessment of how to achieve customer-defined quality criteria and the kind of leadership required to get the organization mobilized in the most cost-acceptable way.

QUALITY IN THE DEPARTMENT OF THE NAVY

The Department of the Navy (DON) approach to quality improvement is called Total Quality Leadership, or TQL. TQL has been defined as the application of quantitative methods and people to assess and improve:

- materials and services supplied to the organization,
- all significant processes within the organization,
- meeting the needs of the end user, now and in the future.

TQL was developed by the Department of the Navy for the Department of the Navy. DON leaders examined various approaches and concluded from their studies that Deming's philosophy and methods best suited the unique requirements of the organization. Deming emphasizes leadership responsibility and offers a systems approach to managing work and leading people. In the view of the Department, his approach is the most comprehensive--driven from the top, focused on the user, with decisions based on hard data.

The Deming approach makes clear the relationship between quality and productivity. His emphasis on process improvement--on improving the quality of the product or service--is one that ultimately leads to reduced costs and higher productivity. Deming also provides a clear way to pursue continuous quality improvement, based on the user's definition of quality and the use of statistical theory.

The Deming philosophy emphasizes teamwork and cooperation, important to the Department's Sailors and Marines and to those who support them in their mission. Deming also places great value on people and the knowledge they possess. Finally, Deming stresses that leaders have the prime responsibility for making system changes, an essential component of military operational commands.

The Department of the Navy's approach to total quality evolved over a decade. Aviation depots and naval shipyards in the Department of the Navy have been

involved in quality initiatives since the early 1980s. In 1989, the Naval Air Systems Command was the first recipient of the President's Award for Quality, testimony to its long-term efforts to improve organizational performance.

In the past 3 years, tremendous strides have been made at the highest levels within the Department, largely through the initiatives of the Secretary of the Navy who then recognized that the Department of the Navy faced a crisis. It would have to meet mission requirements in the future with drastically reduced funding. To remain operationally ready, the organization would have to go through a fundamental change, a "transformation."

In response to this challenge, he chartered an Executive Steering Group (ESG) in 1989 that was made up of the Department's top civilian and military leaders "to lead and guide the TQL transformation" (Garrett, 1991). Members include the Vice Chief of Naval Operations, the Assistant Commandant of the Marine Corps, the assistant secretaries, the systems commanders, and leaders from other selected Navy and Marine Corps commands. The ESG is chaired by Under Secretary of the Navy Dan Howard.

In September 1990, the ESG members traveled to Naval Air Station Pensacola for a 4-day off-site to develop the Department's vision statement, guiding principles, and strategic goals. On 10 February 1992, the Secretary of the Navy, the Chief of Naval Operations, and the Commandant of the Marine Corps signed a strategic goals document that represents the culmination of work that began 22 months ago in Pensacola.

The goals represent one of three documents prepared by the ESG. The first, a vision statement, states that the support establishment of the DON exists to sustain the Navy-Marine Corps team in its mission. It goes on to say that all services to the force will be of a uniform high quality. Processes and systems affecting those services will be continuously improved.

The second document lists the guiding principles developed to achieve that vision. It begins: "The purpose of the DON support establishment is to provide our Sailors and Marines with the ability to go anywhere, anytime, to defend the nation's interests successfully and survive." It makes reference to "Total Quality Leadership" (TQL) as the approach to be used to describe total quality efforts within the Department.



Commandant of the Marine Corps Gen Carl E. Mundy Jr., Under Secretary of the Navy Dan Howard, Secretary of the Navy H. Lawrence Garrett III, and Chief of Naval Operations ADM Frank B. Kelso II, at the signing of the DON strategic goals, 10 February 1992.

The strategic goals themselves address five areas:

- (1) **Integration**, which refers to the fully integrated Navy-Marine Corps team and the development of strategies and tactical doctrines that will maximize its combat effectiveness;
- (2) **Human Resources, Education, and Training**, which addresses improving the quality of the work force through innovative changes affecting recruitment, training, and quality of life;
- (3) **Acquisition**, which is concerned with improving the process by which maritime weapon systems are designed, developed, tested, and manufactured;

- (4) **Innovation and Technology**, which looks at ways to improve the identification and introduction of new technologies and to create a climate that fosters innovation and invention; and
- (5) **Facilities**, which calls for operating shore facilities that are properly sized and maintained and that result in improved living and working conditions.

These goals say, in effect, that the entire Department will focus on quality as it plots its course for the future. It also means that the leadership accepts responsibility and accountability for changing the things that are not working well and for finding more efficient ways to do business. To quote Deming, "The best way to predict the future is to make it yourself" (Reilly, 1991).

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APPENDIX

**Department of the Navy
Strategic Plan for
Total Quality Leadership:
Vision
Guiding Principles
Strategic Goals**



DEPARTMENT OF THE NAVY STRATEGIC PLAN FOR TOTAL QUALITY LEADERSHIP



On February 10, 1992, strategic goals for the Department of the Navy (DON) were signed out by the Secretary of the Navy, the Chief of Naval Operations, and the Commandant of the Marine Corps.

This document is the first of its kind in the history of the Department. It says, in effect, that the entire organization will focus on quality as it plots its course for the future. It also means that the leadership accepts responsibility and accountability for changing the things that need changing and for finding more efficient ways to do business. Emphasis is on a fully integrated Navy-Marine Corps team.

The strategic goals represent one of three documents that are the foundation for the DON strategic plan. The other two documents, a vision statement and a set of guiding principles, are reprinted here as well. Strategic goals essentially describe the results to be realized in working toward the vision of the organization.

The vision statement, guiding principles, and strategic goals were drafted by the DON Executive Steering Group, formed by Secretary Garrett in 1989 to lead and guide the transformation to Total Quality Leadership (TQL), the approach to be used to implement total quality efforts within the Department. The group is made of 28 top leaders within the Department, including the Vice Chief of Naval Operations and the Assistant Commandant of the Marine Corps. Under Secretary of the Navy Dan Howard chairs that group.

All three documents make reference to the support establishment. Mr. Howard explains what is meant today by that term. "Our concept of the support establishment has changed. The Department of the Navy does not fight wars, the Commanders in Chief fight wars, so in that sense the entire Department is a support establishment. That means that our customer ultimately is the individual Sailor and Marine. The guiding principles document begins with the statement that 'the purpose of the DON support establishment is to provide our Sailors and Marines with the ability to go anywhere, anytime, to defend the nation's interest successfully and survive.'"

To reach the strategic goals, "strategies" and "actions" need to be determined. Toward that end, the ESG is forming working groups made up of senior military and civilian leaders who will define them. As their work progresses, more guidance will be provided to the Department at large.



DEPARTMENT OF THE NAVY VISION, GUIDING PRINCIPLES, AND STRATEGIC GOALS



VISION

The fully integrated Navy-Marine Corps team remains the world's premier force to carry out the national will in an increasingly hostile global maritime environment. It deploys a high quality, multi-purpose, flexible force designed to meet a variety of the most likely contingencies.

In order to respond to the volatile and unpredictable nature of the world-wide threat, our forces must provide deterrence through presence and an ability to project power quickly.

The combined force is sustained in this mission by a support establishment which has dramatically decreased the time necessary to field new weapons systems, alter training cycles, accomplish overhauls, etc.

These and other supporting services, including medical care, are of a uniformly high quality because our leadership accepts responsibility for continuously improving all the systems and processes which govern our support establishment.

The support establishment consists of:

Leaders prepared to exercise their responsibilities with quality as the principal focus.

Properly maintained necessary shore and support facilities.

Acknowledged experts in the technologies key to maritime operations.

Acquisition and maintenance strategies which will strengthen the public/private relationships to produce quality products and services faster and at competitive prices.

Well-trained professionals dedicated to excellence with confidence and pride in their Navy and Marine Corps.

GUIDING PRINCIPLES

The purpose of the DON support establishment is to provide our Sailors and Marines with the ability to go anywhere, anytime, to defend the nation's interests successfully and survive.

In achieving this purpose, the following principles will guide our decisions and actions:

We will accomplish the mission.

We recognize the central fact that our Sailors and Marines are the best prepared and that our units have the highest rates of operational readiness in our history. They are at the heart of our ability to perform the mission. We must maintain that quality.

We are all responsible for accomplishing the mission. That is our first loyalty. We must strive to find new ways to cooperate within the DON which look beyond a single service warfare community or traditional role and responsibility. Pride, professionalism and a sense of community are extremely important but we must ensure that they are not rigid barriers to our interoperability. The valuable process of competing for resources and roles must not be carried to divisive and destructive extremes.

We accept responsibility for taking control of and improving all the systems and processes through which we support Sailors and Marines. We can ensure that the weapons, ammunition, training, transport, health care, housing and all other goods and services which constitute that support are of predictable high quality and available on time and in sufficient quantity for any task they may be called upon to perform.

We must use innovation to meet current and future requirements and challenge ourselves to develop creative methods, including new technologies, to enhance our support to our operating forces.

We are committed to honesty and integrity, recognizing that the public trust and defense of the nation requires the highest standards of moral conduct. By integrity we mean that we will make decisions which are in the best interests of the Navy, the Marine Corps and the nation without regard to personal consequences.

We have adopted the term "Total Quality Leadership (TQL)" as the general term under which we will pursue total quality efforts. However, we understand that it is the concepts and content of those efforts that is important--not what they are called.

STRATEGIC GOALS

We, the leaders in the Department of the Navy, will optimize the effectiveness of the Navy-Marine Corps team by leading our people and managing our systems as an integrated force within a quality-focused organization. We will work to influence our future by translating our vision, mission, and guiding principles into goals, strategies, and actions so that resources and improvements are aligned with the same intent.

We believe that everyone has a legitimate contribution to make in accomplishing these goals; Navy and Marine Corps; military and civilian; operational and support. In starting this translation, we have developed a vision and identified five major strategic goals for the Department of the Navy. These strategic goals are: Integration; Human Resources, Education, and Training; Acquisition; Innovation and Technology; and Facilities. We believe that continuous improvements in these areas are mandatory if the Department of the Navy is to meet the challenges that confront us.

The Department of the Navy will:

Integration

- operate a fully integrated Navy-Marine Corps team that will provide maximum operational capability, capitalizing on the synergism of our operating forces and our support establishment.

Specifically, the DON will:

- develop broad strategies and tactical doctrines that maximize naval service combat effectiveness within the framework of joint and combined operations of the National Military Strategy.
- create and maintain a consolidated naval acquisition, maintenance, and logistics infrastructure that is efficient and responsive to the building, support, and sustainability needs of our naval service forces.
- integrate the focus and efforts of staffs and management organizations to facilitate interaction; and educate our personnel, both military and civilian, in multiple disciplines that affect naval service capabilities and applications.

Human Resources, Education, and Training

- continuously improve the quality of our military and civilian work force through fact-based, innovative systemic changes affecting recruitment, training, and quality of life.

Specifically, the DON will:

- identify and remove the barriers to equal opportunity for all our people.
- improve the military recruiting system through better requirements determination, resource allocation, and day-to-day operations.

Human Resources, Education, And Training (Cont'd)

- improve determination of military training requirements, feedback systems, delivery of training to meet fleet requirements and foster student success; properly fund training and eliminate redundancies in the system.
- improve the civilian recruiting and hiring system through better requirements determination and resource allocation and by assessing national versus local recruiting responsibilities and needs.
- improve civilian training by improving requirements determination, training delivery, and by adjusting resources to match requirements.
- enhance the working environment to improve the performance of quality military and civilian personnel.

Acquisition

- continuously improve the acquisition process to achieve timely design, development, test, manufacture, and support of maritime weapon systems for our Navy-Marine Corps team.

Specifically, the DON will:

- reduce the time from concept definition to fleet introduction.
- stress reduced operating and support costs in all aspects of system design; field fully supported systems with emphasis on interoperability and operational availability.
- foster contractor/government working relationships, emphasizing teamwork built on trust, sound business practices, and the highest standards of ethical behavior. Ensure that an industrial capability for unique naval requirements is maintained.

Innovation and Technology

- continuously improve the process of identifying and introducing new technologies. Ensure our recognition as a world leader in key maritime technologies. Create a climate that fosters innovation and invention.

Specifically, the DON will:

- improve the process of selecting and evaluating technology opportunities; focus DON investment on those technologies that form the foundation of future Navy-Marine Corps system developments; introduce cost-effective technologies into our system as they become available.
- improve the interaction with our sister services, academia, industry and our allies to support the DON technology investment.

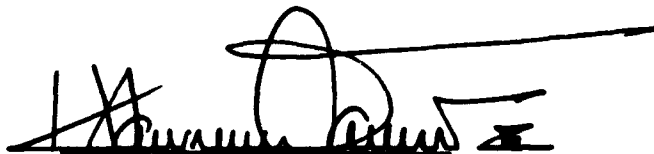
Facilities

--operate an adaptable and responsive shore facilities establishment that is properly sized and properly supported to allow continuous improvement in the quality of service to the operating forces; that consists of well-maintained and attractive facilities, resulting in improved living and working conditions and increased productivity at all its installations; and that consistently performs in an environmentally responsible manner and contributes to the quality of life in the communities of which it is a part.

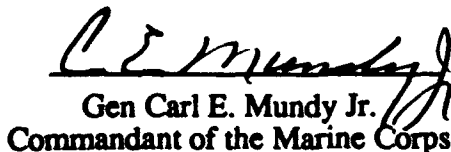
Specifically, the DON will:

- define and implement "quality standards" for facilities that support mission requirements, family and bachelor housing, family support functions, and morale, welfare and recreational activities.
- provide the resources to achieve the defined quality standards over time and maintain the support establishment at these levels; in addition to traditional military construction, consider innovative financing and management arrangements (e.g., cost-sharing, public-private venture, leasing).
- integrate environmental awareness into all DON planning, management, and operations to comply with all applicable environmental laws and to protect the natural resources found on Navy and Marine Corps installations. Minimize waste, conserve energy, and adopt pollution prevention measures to avoid adverse impacts on the environment.

Our vision and associated strategic goals require a significant transformation throughout the naval services. By pursuing our vision, we believe we will enhance our ability to determine our future. Achieving these strategic goals will be neither quick nor easy; however, we believe that our people are capable of meeting the challenges confronting the Navy-Marine Corps team. We recognize that all members of the team have valuable contributions to make to our strategic efforts. As leaders, we will strive to provide the direction and support required for this transformation.



H. Lawrence Garrett III
Secretary of the Navy



Gen Carl E. Mundy Jr.
Commandant of the Marine Corps



ADM Frank B. Kelso II
Chief of Naval Operations

NOTES

Quality planning for impactful improvement: a mixed methods review

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INTRODUCTION

Improving quality is about making health and social care safe, effective, person-centred, timely, efficient and equitable.¹ Quality management is a key component of any high performing healthcare system.² A well-known and popular quality management model is the Juran Trilogy: quality planning; quality control; quality improvement (QI).³ A recent 90-day process by Healthcare Improvement Scotland (HIS) on Quality Management Systems concluded that the current approach to quality management in Scotland is ‘*out of balance*’, with a ‘*lack of effective quality planning*’.⁴ This review aims to help both management and improvement teams to understand the specific components of quality planning, identified through improvement work in a Scottish context and supported by an appraisal of current literature.

DEFINING QUALITY PLANNING

Joseph Juran famously described quality planning within manufacturing as “*a systematic process for developing services and processes that ensure customer needs are met*”.⁵ He described a six-step process that has been adapted within healthcare over the last 30 years, leading to improved patient experience through a better understanding of the unmet needs of service-users.⁵ In addition to refinement of current processes to reduce duplication or waste, this concept has been expanded to include the development of novel services and delivery models.⁶ Quality planning can and does occur at a variety of levels within a healthcare system: macro or organisational level planning at senior management level; meso or group/service level planning for locality based improvement plans; and micro or clinical team level targeting specific services or patient groups.

IDENTIFYING KEY COMPONENTS

In order to identify the key components of successful quality planning, a structured,

mixed methods process was undertaken. First, a series of interviews and focus groups were undertaken with individuals involved in successful local QI projects. In total, 16 people participated in eight interviews and one focus group: eight hospital-based clinicians, two primary care clinicians, two project managers, two quality directorate team members and two service managers. All interviews were conducted between 12 July and 31 August 2018 and lasted between 42 and 61 min. With appropriate consent, interviews were audio-recorded, transcribed verbatim and anonymised. Original recordings were retained on a password-protected computer for the period of analysis and subsequently deleted.

Inductive thematic analysis of the transcribed interviews and focus group led to the identification of five key themes: culture and leadership for improvement; engaging and empowering staff; forming collaborations and networks; building improvement capacity and capability; spreading and sustaining change. These factors then formed the basis of a subsequent narrative review of the literature. Using the five components identified from the interviews and focus group as Medical Subject Headings and/or key search terms, equivalent searches were carried out in three databases: MEDLINE, Embase (Excerpta Medica) and Google Scholar. Reference lists of pertinent articles or reports were hand searched for other relevant material. The five key components of quality planning are considered in detail below in relation to maximisation of impact, defined in this context as a marked effect or influence on quality of care in a meaningful and sustained way. The five components are each described in relation to current literature and illustrated by a practical example from our local context. Quotes within the examples are taken from the interview and focus group transcriptions, as described above.



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CULTURE AND LEADERSHIP FOR IMPROVEMENT

QI leadership involves the creation of a shared vision (shared between frontline teams and managers/leaders), aligning improvement activities with that vision, and nurturing a culture that supports and sustains improvement.⁷ Culture or '*the way we do things around here*' has a major influence on the function and outcomes of organisations.⁸ Culture is primarily the product of three main influences situated within a set of overarching values: the *behaviour* of leaders; the adopted *systems and processes* (such as hiring and rewarding); and the *practices* of groups and individuals.⁹ Different settings and services within a health and social care environment will have their own set of shared behaviours, values and beliefs. Understanding these at the quality planning stage can help identify barriers and enablers to the initiation and spread of improvement activity.

The promotion of innovative thinking and novel solutions requires specific cultural elements as described by the King's Fund: inspiring vision and strategy; positive inclusion and participation; enthusiastic team and cross-boundary working; and support and autonomy.¹⁰ Each of these elements are promoted by collective and compassionate leadership that ensures staff are supported to deliver safe, effective and empathetic care. Furthermore, the increasing emphasis on co-production (collaboration between service providers and service users) of health and social care services requires leaders to develop the specific skills required to recruit and support service users to undertake such roles.

While the importance of culture in quality planning is widely recognised, there is limited utilisation of the tools available for measuring 'quality climate' or readiness

for QI activity. The literature includes a vast number of organisational culture survey tools that are used within the public and private sectors.¹¹ Most of the tools measure dimensions such as leadership, teamwork, organisational structure, resources and communication networks. However, many of them are intensive, cumbersome and somewhat impractical in most healthcare settings. The Culture of Care Barometer, developed in 2014 following the report into the failings at Mid Staffordshire Hospital¹² is a tool specifically designed to measure the culture of care and compassion within an organisation.¹³ The barometer gauges performance in four factors: Trust (or Board) level values and culture; team level support and management; support and respect between colleagues; constraints in undertaking the job. In the pilot studies, the Barometer was found to add depth and richness to the feedback received in staff surveys, allowing exploration of the feelings of staff at all levels to promote dialogue and change.¹³

ENGAGING AND EMPOWERING STAFF

Staff engagement is an essential ingredient of sustainable QI.¹⁴ When staff are engaged it infuses everything they do with purpose, energy and enthusiasm. It is therefore vital that staff engagement is considered at the quality planning stage. As discussed earlier in this review, having an engaged, enthusiastic, compassionate, transparent and collaborative leadership team at senior management level is a necessary precondition to achieving staff engagement. Successful leaders are those who listen to truly understand what matters, adopt an inclusive grassroots approach to quality, give staff a voice, and empower them to try new and innovative ideas in a safe environment.¹⁵

A key component of empowerment in the quality planning stage is allowing people to find an 'inner connection', a link between what matters to them and what matters to the organisation.¹⁶ This approach parallels the well-known 'What matters to you?' campaign that encourages clinicians to explore the important issues in their patients' lives, thereby driving deep personal engagement and genuine partnership. Storytelling can be a powerful tool to captivate interest as it enables articulation of emotional aspects alongside the factual content, allowing expression of tacit knowledge.¹⁶ Staff may be sceptical of QI initiatives, particularly in the planning stages.¹⁷ This may be because they confuse improvement with assurance, which is viewed as a punitive and judgmental process when externally imposed targets are not met. It is important to dispel this myth from the outset and to create an inspiring, bottom-up, shared vision that is truly meaningful to all staff. This involves exploring their intrinsic motivations, asking and listening to what matters, and encouraging innovative and creative change ideas.¹⁷ Effective questions can stimulate, guide and empower employees to think critically about the system and processes in which they work.¹⁸ Locally we have

Practical example 1: Collective leadership

When quality planning work began within NHS Lothian mental health services, there was a recognition that it needed to involve 'harnessing people's natural instincts to want to use their experience, their intellect and their desire to improve patients' lives' and somehow translate that enthusiasm into projects that 'grow it into something that's across the whole service'. There was a desire from those in leadership roles within mental health to ensure that they were 'capturing the ideas of the people who are actually working with the patients about what is needed'. This inclusive, collaborative approach has permeated all stages of quality planning within mental health services. In the initial stages of the programme, the clinical lead and project manager spent time collating existing projects and discussing ideas with the individuals already involved in improvement work to 'make sure they feel part of the programme'. The 1-year plan that evolved was the result of careful consideration of the needs of the service, the views of stakeholders and scrutiny of other organisations' quality plans. But the team in mental health are the first to admit that it also involved a few 'educated guesses' and 'an expectation that we weren't going to get it right first time'. The subsequent 3-year quality plan built on the learning from the first year, and involved much more structured engagement with patients, carers and staff, to ensure that it reflected the views of all stakeholders.

Box 1 What are your improvement opportunities? A nine-question approach

1. Does the problem keep people awake at night?
2. Does this problem or issue occur commonly?
3. Does the problem arise from a chaotic system?
4. Can your problem be improved?
5. What has stopped you improving this problem or issue?
6. Is the service or process undergoing any change?
7. Does this problem upset people?
8. Does the problem lead to avoidable costs?
9. Can your problem be measured?

developed a series of thought-provoking questions to help stimulate conversations and ideas, outlined in [box 1](#).

FORMING COLLABORATIONS AND NETWORKS

A key component of quality planning is the development of collaborations and networks to foster and support QI activity.¹⁹ The Health Foundation defines a network as “a cooperative structure where interconnected groups or individuals coalesce around a shared purpose and where members act as peers on the basis of reciprocity and exchange, based on trust, respect and mutuality”.²⁰ It delineates the five core features of effective QI networks as: critical mass; common purpose; collective intelligence; cooperative structure; community building.²⁰ The features are interdependent, collectively enabling a network to support service delivery while encouraging learning and change.

QI collaboratives exist within many networks, whereby select members of the network work together to rapidly achieve improvement in a topic of interest, with the aim of spreading the learning to others through the network.²¹ The Institute of Healthcare Improvement introduced the concept of the ‘Breakthrough Series Collaborative’ in 1995, a way of helping healthcare organisations to close the gap between improvement science

Practical example 2: Fostering engagement by aligning priorities

The introduction of quality improvement (QI) into primary care in NHS Lothian has, at times, felt like ‘something that one GP was interested in, and tries to drag everybody else along’. Most general practitioners (GPs) felt that their workload prevented them from dedicating any time to quality planning and that it was an additional burden that should be shouldered by those with dedicated time in their job plans. In a canny move to align improvement work with the priorities of individuals, one of the first projects undertaken by the East Lothian Cluster Quality Lead centred on workload reduction. The aim of the project was to ‘make our systems more efficient and show ways of creating more time in the working day, then people’s creativity would open up a wee bit and perhaps feel able to then engage with changing things and making things better and feeling enthusiastic about it’. The dual effect has been to reduce the administrative burden on GPs, thereby releasing a small amount of time, as well as promote enthusiasm and buy-in to the concept of QI more generally.

Practical example 3: The Newborn Care Collaborative

The Newborn Care Collaborative (NCC) was conceived in 2013 and is a locally developed network consisting of 10 teams, each involving between six and 20 staff members from a variety of professional groups. Each team focuses on a particular topic and asks questions, extracts and analyses data, implements tests of change, and assesses improvement related to their area of interest. The growing number of individuals trained in quality improvement (QI) within the unit are spread between the groups to provide informal ‘just in time’ coaching to the rest of the group. Each month the groups take turns to present their run charts and achievements on a board within the unit and at departmental meetings to allow ideas to spread and achievements to be celebrated. Temporary staff members, such as junior doctors on 4-month or 6-month rotations, are asked to select a group to join and are expected to either involve themselves with an ongoing project or, if desired, initiate a new QI project. Parents of ex-patients, pharmacists, social workers, domestic staff and microbiology are all involved, ensuring that the NCC is a truly collaborative network of individuals dedicated to improving care within the unit. Everyone within the collaborative is involved in discussing unit priorities and creating the 2-year strategic plan.

and practical implementation, through learning from each other and recognised experts.²² Such collaborations can promote dynamic improvement strategies that translate into dramatic results, with rapid dissemination of successful change ideas. Similarly, communities of practice, classically defined as groups of people who share the same concern or passion, are growing in popularity in the National Health Service, with local partner organisations working together to plan, design and deliver more integrated services that better meet the needs of the population. Such communities can exist online, with the Health Foundation’s Q community consisting of dozens of online groups that interested individuals can join to share and collaborate, all motivated by the desire to improve health and care quality across the UK.

Networks can also be a valuable resource for benchmarking performance against internal and external departments or organisations.²³ They provide a platform to learn from organisations achieving excellence, and motivation to continually improve performance. Juran introduced the concept of benchmarking in his 1964 book ‘Managerial Breakthrough’ when he asked the question “What is that organisation doing that gets results so much better than ours?”.²⁴ Asking such questions can motivate teams to reflect on their performance, learn from others and consider adopting external solutions.¹⁶

BUILDING IMPROVEMENT CAPACITY AND CAPABILITY

A key part of quality planning, improvement capability has two dimensions: individual staff member capability and organisational capability.²⁵ The totality of this review covers the specific capabilities required in the wider organisational context for improvement that is, culture, leadership, strategy, stakeholder and staff engagement, collaboration and spread. This section deals specifically

Practical example 4: Building capability

The large number of general practitioners (GPs) within NHS Lothian, along with the pressures of clinical work, means that attendance at Quality Academy courses is unrealistic for the vast majority. To build capability and foster a 'whole-team' approach, certain clusters of primary care practices within NHS Lothian have therefore utilised the expertise of the quality team based at NHS Lothian's headquarters, Waverley Gate. The team has been able to provide training in quality improvement methodology and support to plan and develop new projects. The training sessions have included receptionists, administrative staff, practice managers, nurses and GPs in a staggered format to allow normal service to continue within the practices. The NHS Lothian practices have also utilised external resources, many of which are freely available, such as the NHS School for Change Agents (<http://horizonsnhs.com/school/>).

Practical example 5: Spreading change

Planning for sustainability and spread is often the aspect of quality planning that receives least attention. The neonatal service in NHS Lothian is working hard to embed the changes that they have made to their service by allowing nursing staff recognised 'quality improvement (QI)' time during their working day. This has required improving communication with the senior nurses who coordinate the staffing for each shift, and encouraging more dialogue between the senior medical and nursing teams. Innovative ideas and improvements are spread to other similar units via the Vermont Oxford Network, non-profit collaboration of healthcare professionals working within neonatal care with the aim of improving the quality and safety of medical care for newborn infants and their families through a coordinated program of research, education and QI projects.

with individual capability—the extent to which individuals are able to develop and deploy the skills, tools and knowledge necessary to improve the quality and safety of the care they provide. Research suggests that a lack of these skills among individual clinicians and managers is a barrier to improving quality in health and social care.²⁶

At the quality planning stage, improvement teams should consider the skills that already exist within the service, so that they can make full use of the clinicians and teams with existing QI and patient safety experience. Departments with little improvement expertise or experience need to consider use of external resources to help them up-skill their staff and teams. While this sounds costly, local work has shown that it is possible to set up an effective programme for relatively modest costs. Delivery of in-house training or making use of free or low-cost external resources can help to achieve this. One of the main challenges, however, is time for staff to attend training sessions; time for trainers who lack dedicated improvement activity in their job plans to be released from their day-to-day clinical responsibilities; and time for those with dedicated activity to keep up with training demands.^{27 28}

Regular evaluation of capability is necessary to ensure it is continuing to meet the needs of the workforce, the department and the organisation. It will evolve over time as the capabilities of teams grow and a common language around improvement begins to emerge.

SPREADING AND SUSTAINING CHANGE

Spreading and sustaining change is an oft-neglected aspect of quality planning.²⁹ Consequently, across the UK, a third of healthcare improvement projects never spread beyond their original unit, a further third are embedded within their own unit and spread across an organisation, and a final third are spread across their own and other similar organisations.³⁰ This statistic emphasises the importance of considering a strategy for spread and sustainability at an early stage.

Spread has been defined as “*when best practice is disseminated consistently and reliably across a whole system and involves the implementation of proven interventions in each applicable care setting*”.³¹ Likewise sustainability is “*when new ways of working and improved outcomes become the norm*”.³⁰ In other words, it is when an improvement has become an integrated and the mainstream way of working withstanding challenge and variation over time, through a process of continuous improvement.³²

The two widely recognised approaches to spread are dissemination and diffusion. Dissemination is the planned, formalised spread that occurs through rigid, vertical hierarchies. Diffusion is informal, peer-mediated organic flow often through word of mouth or social networks. In reality, a combination of these approaches is necessary to support spread throughout and beyond a large health or social care organisation.^{33 34} Planning for spread involves defining target audiences, agreeing on key messages for each audience, defining methods or strategies to reach each target audience, and a measurement plan to monitor and evaluate success. The concept of social diffusion helps to define the target audience: Once a new idea or behaviour has been adopted by 15%–20% of a particular population, it has the critical mass to spread without much additional scaffolding.³⁵

Sustainability, or holding the gains, relies heavily on a supportive management structure and the development of structures to ‘foolproof’ change, including technology to support sustained implementation of the intervention.³⁶ Robust and transparent feedback systems must generate performance data that is appropriately pitched for differing audiences, mapped using tools that allow shared analysis of systems. All staff should be aware of, and take pride in, the QI work being undertaken and the gains secured.³⁶

CONCLUSION

Quality planning is an important pre-requisite of impactful QI. This review summarises key literature relating to the five important aspects of quality planning (as shown in figure 1), accompanied by practical examples to aid



Figure 1 The five key aspects of quality planning.

understanding. The quality planning process should involve defining priorities and utilising data-driven decision-making to clarify and understand the issues that are important to patients, service users and staff. In order for QI activity to have the best chance of improving care in a meaningful and sustained way, each of the five aspects discussed above must be considered at the planning stage.

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The Roadmaps of Total Quality Management in the Greek education system according to Deming, Juran, and Crosby in light of the EFQM model

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Abstract

In the present paper the roadmaps leading to quality are presented. They refer both to the general model of Total Quality Management as well as to the quality gurus Deming, Juran, and Crosby. Views of Greek teachers are analyzed according to EFQM model. Common points and differences of these views are stressed and valuable conclusions are drawn in the field of Total Quality Management in Greek Education.

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Keywords: Quality Management, Greek Education, Deming, Juran, Crosby

1. EFQM Model

The EFQM model is a widely known model, which can be applied by an organization in order to implement the principles of Total Quality Management and to achieve excellence. The EFQM model consists of a set of criteria, and is mainly classified into two categories called “enablers” and “results” (Anastasiadou, et al., 2014a,

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Anastasiadou, et al., 2014b; Hides et al., 2004).

The model is focused on the human factor. The first five criteria “enablers” (leadership, policy and strategy, human resources, partnership-resources and processes) are the main factors to be applied by the company / organization in order to increase performance and the model is completed in the other four criteria, which are the “results” (customer results, people, society and the business results (Calvo-Mora et al., 2006).

In the present research the criteria of EFQM of model in respect Deming’s, Juran’s and Crosby’s philosophies are recorded. The views of Secondary Education teachers are analyzed in light of these criteria, highlighting thus, the dimensions of the Greek educational reality. Section 2 briefly presents the Deming’s, Juran’s and Crosby’s philosophy. Section 3 describes the methodology and the description of the data used in the model. Section 4 analyzes the results of the performed empirical analysis. Finally, the last section summarizes and concludes the findings.

2. Deming’s, Juran’s and Crosby’s philosophy

Deming’s philosophy: Dr. Edward Deming has been characterized by many researchers as “an emblematic figure for the administration of quality” (Petersen, 1999). The theory and method applied by Deming are accepted worldwide, as numerous studies have used them on the TQM. Although he does not provide a clear definition of quality, he believes that quality is defined and determined by the customer’s needs. He insists not only on the prominent role but also on the responsibility of management executives. It is precisely the managing executives who are responsible by 94% for the potential improvement of quality, which is limitless, and it is these people who are in charge of maintaining the 14 points of Deming (Deming, 1986; Stefanatos, 2000). In any case the participation of employees is a necessary and sufficient condition for healthy communication among employees aiming always at achieving real and not unrealistic goals, aiming also at eliminating working standards and numerical percentages. He introduces and separates the special causes from the common causes, he focuses on the control during production and not in the end products, adopting the systematic approach in the problem solution, known as Deming’s cycle (PDCA) and he proposes the use of statistical techniques of processes control (SPC) aiming at reducing variability (Stefanatos, 2000).

The logic of Deming’s cycle, as shown by the initials of the words Plan-Do-Check and Act is based on the belief that everything begins with planning, the application of the plan follows, the necessary controls and the tests come next and finally, there are the necessary structural actions. Additionally, according to Deming, the Quality Guru, the price, regarding suppliers cannot be the only criterion, while he insists on the stability in choosing one supplier. Below there is a summary of the 14 steps deemed necessary to transform the corporate culture. The first step (step 1) refers to the obligations of the management to create an environment of stability and continuous improvement of services and products through a long-term clear plan, vision and purpose. This can be achieved if the administration adopts the new philosophy of change, commitment, and dedication to continuing improvement, step 2. The new method of administration involves replacing the old management methods, which are not effective in today’s business environment. Deming in step3 proposes to detox from the product inspection to achieve quality. He refers to the avoidance of selection of raw materials and suppliers exclusively based only on price in step 4. In step 5 continuous improvement of the quality of production and service system as basic is exposed. Deming believes in quality away from the obstacles of administration, and focuses on human resources.

The establishment of educational programs and training of employees (step 6) will help remove officials’ fear of the new, eliminate punishment (more working hours, salary reduce etc) and establish a safe environment, that all ideas will be disused (step 8) and eventually promote creativity and cooperation. The above elements in order to be achieved require new management methods thus managers could lead, guide and support staff properly (step 7). Also, teamwork (step 9) is the cornerstone for modern management, and through teamwork problems could be avoided in the production process. In step 10 Deming abolishes the mission statements that require new levels of productivity and no defect in the product, while simultaneously they encourage the elimination of work standards and the quantitative goals of production, which favour quantity and hamper quality and productivity (step 11). The company should reward employees (step 12) thus employees feel proud of their work and achievements. Additionally, through a program of training and continuous retraining (Step 13) to innovations, new practices and

skills ensure the acquisition of new skills and good execution both for workers, managers and top executives. Last but not least step 14 is the “management’s long term commitment to implement all of the above 13 steps” (Anastasiadou et al., 2015; Deming, 1986; Stefanatos, 2000).

Juran’s philosophy: Juran believes that the definition of quality is interwoven with “suitability” of a product or a service to be used and is directly connected with customer satisfaction (Juran, 1974). According to Juran the determination of customers’ needs, who are distinguished in internal and external, and the interpretation transformation of these needs into specifications are imposed (Stefanatos, 2000). However, Juran introduces a second dimension of quality, which is connected to the correct, unmistakable production of the product or service. For Juran a necessary and sufficient condition for quality assurance is the correct and programmed design. Moreover, Juran maintains that quality is not ensured incidentally and is not for free. It is the management which is 80% responsible for Continuous Improvement of quality. Consequently, it is the management, which is mainly responsible for “low” quality (Juran, 1992; Juran & Gryna, 1993). Juran proposes quality control through the trilogy Design for Quality, Improvement for Quality and Quality Control. He also proposes the Implementation of a 9- step Roadmap. These steps refer to the designation of the customers (step 1), the designation of customers needs (step 2), the translation of these needs into technical procedures (step 3), the product development which satisfies these needs (step 4), the improvement of the product so that it satisfies the needs of the product and of the business (step 5), development of the production process capable of producing this result (step 6), improvement of the process (step 7), verification of the fact that this process may function in real conditions of production (step 8), incorporation of this process in production (Stefanatos, 2000). He proposes the use of statistical methods and especially of Pareto diagram, which presents the contribution of each cause in the end result. The principal for the diagram is based on the fact that in quality issues, among others, 20% of the causes provoke 80% of the problems.

Juran’s theory is based on three dimensions and is known as “The trilogy of quality”, (Juran, 1992; Juran & Gryna, 1993). In the first phase there is quality planning by providing for special training of all participants in a company / organization on quality design. Leadership then needs to identify internal and external customers, to concretise their needs, to design those products that satisfy them completely and finally to consolidate the favorable procedures through which the products will be produced (Stefanatos, 2000).

The second phase includes checking quality. During this process compliance with the standards of quality dominates. This is achieved by comparing the results against the standards set and applying coordinated remedial efforts when there is a difference between these two. The third and final part of the “trilogy of quality” is to improve quality (Stefanatos, 2000). It is a process in “which it is necessary to reduce the waste and chronic defects and achieve a new improved quality control zone” (Juran, 1988; Juran, 1992; Juran & Gryna, 1993).

Crosby’s philosophy: For Crosby quality is interwoven with conformance to requirements and he emphasizes on prevention instead of estimate, based on the 14 step repetition, with clear commitment on the part of Administration, which is exclusively responsible for Continuous Improvement. Crosby does not focus on statistical procedures. Instead he focuses on quality costing and he classifies cost into compliance and non-compliance cost. He proposes the formation of quality improvement groups and quality councils. Crosby’s principle is zero defects.

Crosby’s main idea governing Quality and therefore its improvement is contained in his slogan 'zero defects' (Crosby, 1984, Bendell et al., 1995). The philosophy of Crosby is expressed through four absolutes. According to the first one Quality is compliance with requirements. Second, Prevention instead of estimate. Third, Standard is the zero defects, Fourth, Quality Measurement is the value of non-conformities (Crosby, 1984).

Crosby proposes the following 14 steps to improve quality. 1. Management Commitment, 2. Quality improvement team 3. Measurement of non-conformities 4. Measurement of quality costs, 5. Sensitization to Quality, 6. Corrective actions, 7. Design for Zero Defects), 8. Staff Education, 9. Day of Zero Defects, 10. Definition of goals, 11. Elimination of error causes, 12. Recognition, 13. Quality Councils and finally 14. Repeat all the above steps (Crosby, 1984).

3. Methodology

3.1. The European Quality Award Model (EFQM Model)

The European Quality Award (EFQM Model) is a largely known model, which an institution can apply to implement Total Quality Management Principles to achieve excellence. The EFQM model consists of a set of criteria, which are mainly classified into two categories called “enablers” and “results” (Dervitsiotis, 2005; Blanas, 2003; Campatelli et al, 2011; Martin-Castilla, 2002). The nine EFQM model criteria are analyzed below based on international literature. The first five criteria – “enablers” (Leadership, Policies and Strategy, Human Resources, the collaborations – resources and procedures) are the basic factors that the company/organization must put into practice, so that it raises its performance (McAdam & Bannister, 2001). The four criteria that are left are the “results” (the results of customers, Human Resources, society and company/ institution).

3.2. The sample

The research sample consisted of 300 Greek teachers in secondary education. The strong as well as the weak points of the five criteria – “enablers” (Leadership, Policies and Strategy, Human Resources, the collaborations – resources and procedures) of the EFQM model were registered and analyzed. The reasons of the low performance of the education process were discussed.

3.3. The first factor: “Leadership”.

The first five criteria – “enablers” (Leadership, Policies and Strategy, Human Resources, the collaborations – resources and procedures) are analytically presented as follows.

The first factor named “Leadership” consists of 7 questions, which concern the Leadership and are presented in the following Table 1. “Leadership” examines the degree to which the leader develops systematically the vision, the values, the mission and generally the culture of the institution, the mechanisms and the procedures, which promote transparent and equal treatment of all members involved, both teachers and students, which reinforce their communication and collective action of all teachers and the mechanisms that encourage the efforts of teachers and students, their abilities and skills in order to promote effective activities.

Table 1: Leadership

LEADERSHIP	DEMING	JURAN	CROSBY
HG1. The Leader notifies the rest of the teaching staff of the goals, the vision and the values of the institution/ school.	✓	✓	✓
HG2. The Leader improves/ reinforces his/her actions, so as to meet the present and future needs of the institution.	✓	✓	✓
HG3. The Leader plans the organizational structure (not the teaching or research structure), which fits the policy and strategy of the institution.	✓	✓	✓
HG4. The Leader applies a system of basic procedures or activities of reinforcement of the policy, the strategy and the purpose of the institution.	✓	✓	✓
HG5. The Leader is in contact with the different participants in order to be aware of their expectations and views.	✓	X	✓
HG6. The Leader encourages the students’ and teaching staff’s participation in acts of improvement.	✓	✓	X
HG7. The Leader recognizes publicly the successful acts of individuals and teams towards improving quality	✓	✓	✓

3.4. The second factor: “Policy and Strategy of the institution”.

The second factor consists of 10 questions, which concern the Policy and Strategy of the Institution and are presented in Table 2, which follows. “Policy and Strategy” refers to the long term target setting, the supporting and clear policies (understanding the needs and expectations as well as the priorities, involving all parties in the implementation of goals regarding the strategies of the educational institution, dealing with specific practices for the improvement of educational procedures).

Table 2: Policy and Strategy of the institution

Policy and Strategy of the Institution				
POLICY AND STRATEGY		DEMING	JURAN	CROSBY
	PS1. The policy and strategy of the organization	✓	✓	✓
	PS2. The central policy and strategy of the institution are expressly recorded in writing	✓	✓	✓
	PS3. All the sections/ parts of the central policy of the organization participate in the procedure of forming and notifying its policy and strategy.	✓	✓	✓
	PS4. There is a formal procedure of the revision and readjustment of the policy and strategy of the institution.	✓	✓	✓
	PS5. The central policy and strategy of the institution is constructed following a strategic plan.	✓	✓	✓
	PS6. The targets of the central policy of the institution are defined in writing and following a clear quantifiable way.	✓	✓	X
	PS7. The targets are communicated to all the levels of the organization.	✓	✓	✓
	PS8. The principles of quality have been integrated in all the policies and strategies and the goals of the institution.	✓	✓	✓
	PS9. There is a procedure, which allows the development of policies and strategies of the institution and their adjustment in a short-term frame.	✓	✓	✓
	PS10. The needs and expectations of the participants are taken into account in defining and revising the policies and strategies.	✓	✓	✓

3.5. The third factor: “The Human Resources Management”

The factor Human Resources Management consists of 8 questions, which concern Human Resources Management and are the following as we see in the following Table 3.

The Human Resources Management” examines the possibility of the teaching staff to develop their knowledge and skills individually as well as on a team level in order to respond the most to the vision, the policy and strategy of the establishment as well as to their personal needs and ambitions to progress in their career. It also examines the communication, cooperation, and understanding, offering equal opportunities, meritocracy, transparency, reward, motivation and recognition of the efforts of the staff, the training programs and educational seminars in order to improve the skills of educators.

Table 3: The Human Resources Management

The Human Resources Management				
The Human Resources Management		DEMING	JURAN	CROSBY
	DA1. The human resources management determines the current and future needs of the staff regarding their knowledge, abilities and skills.	✓	✓	✓
	DA2. Training programs are developed by the human resources administration to improve knowledge, abilities and skills of the teaching staff.	✓	✓	✓
	DA3: Activities, which support the dedication and involvement of staff in improvement actions, are promoted by the administration of human resources.	✓	✓	✓
	DA4. Teachers are encouraged by the human resources administration to take initiative and perform actions of improvement.	✓	✓	✓
	DA5. Human Resources Management creates communication channels suitable for exchanging the best practices, knowledge and experience.	✓	✓	✓
	DA6. Efforts aiming at improving quality either in an individual or team level are recognized.	✓	✓	✓
	DA7. Social benefits and improvement of service and facilities for the staff are established by the Human Resources Management.	✓	✓	✓
	DA8. Active participation of personnel in actions regarding health, security, the environment and social and moral responsibilities is encouraged by the Human Resources Management.	✓	✓	✓

3.6. The fourth factor: “Cooperation and Resources”.

The fourth factor is composed of 8 questions, which form the Category Cooperation and Sources, and are presented in Table 4 that follows.

The provision of goods and efficiency stands as the essential factor for success and acts decisively towards the implementation of the vision and the policy and strategy of the institution. This factor also deals with the right choice of strategy, the right financial planning, the right collaborators as far as suppliers are concerned, the right investment in equipment, machinery, buildings, materials, natural resources utilization especially of energy, respect of the environment and the use of environmentally friendly technological achievements with the goal of developing innovation and achieving excellence, and minimizing the effects to the environment

Table 4: Cooperation and Resources

Cooperation and Resources				
Cooperation and resources	Cooperation and resources	DEMING	JOURAN	CROSBY
	SYN 1. Partnerships are set up with suppliers to create values and mutual benefits.	✓	✓	X
	SYN 2. Agreements are concluded, which guarantee the exchange of knowledge and experience with the suppliers.	✓	✓	X
	SYN 3. Proper investments are attracted to develop policy and strategy of the institution as well as its continual improvement.	✓	✓	✓
	SYN 4. The right handling of inventories, materials and energy.	✓	✓	✓
	SYN 5. There is a determination and evaluation of the effect of new technologies to the institution.	✓	✓	✓

	SYN 6. Mechanisms are used for the collection and handling of data supporting the policy and strategy of the institution.	✓	✓	X
	SYN 7. Mechanisms are operated aiming at determining the needs of the participants to be informed.	✓	✓	X
	SYN 8. Information is utilized to constantly improve the management and service system.	✓	✓	✓

3.7. The fifth factor: “Procedures”

“Procedures” are divided into Educational Procedures, Research Procedures and Administrative Procedures (Table 5). The criterion “Procedures” holds a central position in the conditions and the results. It is a crucial criterion, because it can influence decisively the well-being and the success of the institution in a competitive environment. It evaluates the strengths and weaknesses of each process. The most effective processes that will contribute to achieving the mission of the company or organization and in their future improvement and the benefits are recognized, quantified and compared. Moreover, by assessing the processes, the basic parameters and selected policies are compared in order for a decision to be taken whether they are appropriate and beneficial for the future success.

Table 5: Procedures

Procedures				
Procedures	<i>Educational Processes</i>	DEMING	JURAN	CROSBY
	ED1. The Educational activity responds to the needs and expectations of the students.	✓	✓	✓
	ED2. The Educational activity responds to the needs and expectations of the institutions/schools.	✓	✓	✓
	ED3. The Educational activity responds to the needs and expectations of society.	✓	✓	✓
	<i>Research Processes</i>			
	ER1. The research process responds to the needs and expectations of the students.	✓	✓	✓
	ER2. The research process responds to the needs and expectations of the institutions/schools.	✓	✓	X
	ER3. The research process responds to the needs and expectations of society.	✓	✓	✓
	ER3. The research process responds to the needs and expectations of society.			
	<i>Administrative Procedures</i>			
	DE2. There is printed material to support the procedures (scope, integrated actions, reliability etc).	✓	✓	✓
	DE3. Responsibilities are delegated to periodically inspect and reevaluate the procedures.			
	DE4. The information collected regarding the demands and suggestions of the participants is used afterwards to upgrade the procedures.	✓	✓	✓
	DE5. Creativity and innovation are applied aiming at developing new procedures and services.	✓	✓	✓
	DE6. Procedures are created in order to ensure adequate service offered to the participants.	✓	✓	✓
	DE7. Particular services are developed to support people and students.	✓	✓	✓

3.8. *The common points of Deming, Juran, Crosby theories relative to EFQM*

We observe that the common points on 3 approaches of Deming, Juran, and Crosby, which are necessary both to design and operate efficiently as to ensure continuous improvement and achieve customer satisfaction. For the successful implementation of every philosophy requires consistent and sustained implementation of the philosophy and of course the active participation of all human resources, management has the primary responsibility for the vision, mission and the implementation of procedures and staff overall. In addition, similarities in the three approaches of Deming, Juran, and Crosby according to Suarez (1992) are as follows: Quality is achieved by adopting a scheme for quality through continuous improvement by repeating the steps leading to it thus administrative support and commitment is necessary. Education and training should be continuous and implemented programs should be evaluated in order to improve the institution or business. The attention should be paid to teachers' continuous training and executive management in order to build expertise, staff knowledge.

Most problems related to quality can be attributed to policy or administration action thus all employees and teachers should be aware of the organization's mission and efforts of the administration should lead to the realization of this mission.

The Management has mainly the responsibility for creating culture-oriented commitment to quality. Effective communication and treatment at all levels is essential. The existence of channels of communication at all levels of the organization is very essential. Development of people virtues like solidarity, cooperation, teamwork, sense of pride.

The majority of quality problems are caused by incorrect actions of the administration. Therefore, improving quality should be conditional on the participation of the administration. The term quality improvement will result to the prevention of problems. The pursuit of quality should be a continuous effort.

Implementation can be done in any organization. Focus on meeting the needs of students' expectations. Measurements are critical. The improvements are not addressed from the perspective of end products.

Focus on supplier quality issues. Suppliers must participate in the effort to upgrade the quality. There are no shortcuts to quality. Managers must provide workers with the means to do a good job.

It should be noted that the philosophy of Crosby are similar to Deming in terms based on the exclusive responsibility of managers for good or bad product quality. Juran, argued that the responsibility for the "low quality" lies mainly in Management (Stephanatos, 2000).

4. Results

This paper examines Secondary Education teachers' views according to Deming, Juran, and Crosby in light of the EFQM criteria, highlighting thus, the dimensions of the Greek educational reality.

The role of leadership is negatively influenced by the lack of vision, values and work ethics, which are observed when values are not defended by leaders themselves.

The fact that all parties involved in education are not connected, due possibly to the lack or inability to understand the expectations, leads to failures or low performance of the institution.

Moreover, low performance is encouraged by lack of culture of excellence and inadequate or imperfect recognition of the efforts of all the parties.

The lack of effective strategy and policy, which is due to vague or even unachievable targets, the lack of evaluation and the lack of application of the principles of quality assurance and the fact of non-updating older ones, the lack of participation of the parties not only in an individual but also in a team level or the unilateral participation constitute inhibitory factors and hinder the successful course of the institution.

The human resource management is the key factor for the success of the institution. Whereas bad human resource management, the inexistence of continuing training and improvement with training programs, the inability for professional development and career, the promotion of the less able, cronyism, intransparency, competitiveness among the staff lead the parties involved not to make the most effort and not to take the initiative to promote excellence and accordingly high quality of the institution

The factor of cooperation and sources is equally decisive for quality assurance. The lack of efficiently handling

resources results in lack of respect for the environment and waste of valuable energy leading to lack of resources. On the other hand, the lack of efficient cooperation both of the leadership with the staff, and with the teachers and students hinders every effort for development, leads to lack of investments and incomplete utilization of the possibilities of technology and know-how.

The development of quality assurance procedures are of extreme importance. The lack of excellence, together with the lack of training and therefore the inability of the human resources to develop their abilities and skills, lead to the absence of delegating responsibilities and hinder every effort of constant improvement and result in poorly meeting the needs and expectations of students, parents, teachers and society.

The representation of the above data is carried out in the 2-level cause – effect diagram based on the 5 criteria on which the EFQM model is founded. More specifically the Ishikawa diagram depicts all the factors or the causes influencing every category separately and which cause low performance of the Secondary school unit (Figure 1).

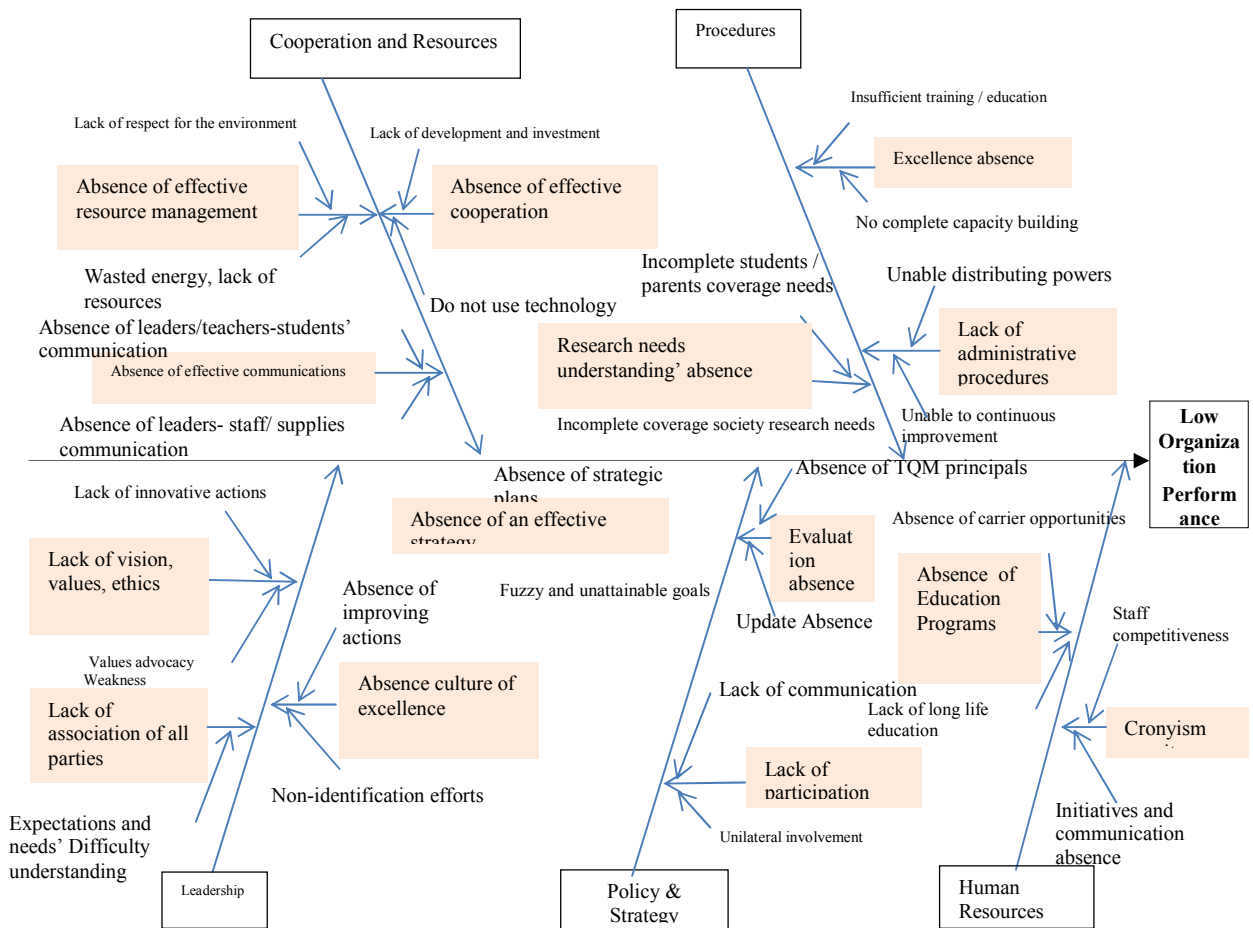


Figure 1: 2-level cause – effect diagram

5. Conclusions

The present study tried to assess EFQM model, which comprises five “enabler” criteria, named Leadership, Policy and Strategy, Human Resources Management, Cooperation and Resources and Procedures. In addition, there was an attempt to capture in depth the relationships among the five “enabler” criteria.

As a result the Fishbone (Ishikawa) Diagram very well known as Cause-and-Effect Diagram clarifies all the factors or causes that affect each category separately, causing a poor performance of the Secondary school unit. Identifying the root causes is essential because only then school leaders, instructors, teachers will be able to understand the situation in depth and propose actions to diminish as many of those causes as possible.

Leadership should develop a vision for an efficient education that meets the needs of all parts of the institution and put the basis of a culture of excellence. Furthermore it is of a major importance all parties involved in education to collaborate seeking for the highest performance of the institution. Communication, cooperation, and understanding of the staff, equal opportunities, meritocracy, transparency, reward, motivation and recognition of the efforts of the staff, the training programs and educational seminars in order to improve the skills of educators are important elements that could promote excellence and thus the possibility of high performance of the institution could be maximized. In this respect, the principal implication is that serious attention is needed to be paid to the vision and actions of education leadership.

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PERSPECTIVE OF JOSEPH M. JURAN'S EDUCATIONAL QUALITY DEVELOPMENT MODEL AND IMPLEMENTATION IN EDUCATIONAL PROSPECTS

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Abstract:

The impact of the globalization era demands quality human resources, namely human resources who are able to face various challenges, changes and also global competition. Quality human resources are created from quality education, so that improving and developing the quality of education is a top priority in managing educational institutions and is very important to do immediately. One quality development model that can be applied is Joseph's quality development model. M. Juran. Juran's quality development concept is actually a quality concept in the business world, which is oriented towards profit/material gain. However, this concept can be adopted/applied to educational institutions that are oriented towards the quality of educational services. Juran mentions the term quality as "quality is fitness for use", namely quality is conformity with customer needs. In the world of education, there are two terms for customers, namely internal customers (school principals, teachers, employees) and external customers (students, parents, government, job market, society). Furthermore, Juran also offers three stages in the process of achieving quality, which is more popularly known as the Juran trilogy, including: 1. quality planning, 2. quality control and 3. quality improvement.

Keywords: *Quality of Education, Juran Quality Concept*

INTRODUCTION

Global changes continue to occur, which are currently marked by the progress of information technology towards digital which is taking place increasingly rapidly and has a significant impact on various aspects of human life, starting from the economic, social, cultural, environmental, political, and also on field of education. This impact is related to the various benefits provided and also the big challenges that must be faced. This is what then requires each country to improve itself in facing these various challenges, namely by mutually improving the quality of its human resources. Because, quality human resources will be able to face various changes, competition and global challenges.

Based on statistical data from the 2019 GTCI/Global Talent Competitiveness Index, namely a ranking of countries' competitiveness seen from the capabilities of their human resources, this shows that Indonesia still has weak competitiveness. Of the 125 countries in the world, Indonesia ranks 67th, while in the ASEAN region, Indonesia ranks sixth.

Looking at these statistical data, the Indonesian government must continue to strive hard to improve the quality of its human resources, so that it can become a country that is competitive and able to face various global challenges. In an effort to produce quality human resources, education has a very important role. Because, the meaning of education itself is the development of potential to have intelligence in thinking and

behaving. Education must be able to produce graduates who are qualified, intelligent, creative and innovative. As stated by Southerland, Gadsden and Herrington, quoted by Riordan, Doran and Connolly, education must continue to produce the latest ideas, the latest innovations and new approaches. Thus, in producing superior/quality human resources, quality education is also needed.

Lee and Walsh, quoted by Fombad, stated that, if young people are given quality education, they will become productive human beings who are able to face challenges in their own lives, even national and world challenges. Based on these problems, creating quality education is something that really needs to be considered and done immediately. Quality education is education that can provide benefits and positive changes for education users. As Juran said about the concept of quality, namely "Quality is fitness for use". That quality is conformity to a person's taste, according to taste is intended to provide benefits to the user of the goods or services.

Joseph M. Juran, a quality development expert, assisted Japanese leaders in structuring the industry so that it was able to export products to world markets. He helped Japan to put quality concepts and tools designed for factories into practice into a series of concepts that became the basis for integrated process management. Juran demonstrated three managerial processes for managing the finances of an organization known as the Juran trilogy, namely, quality planning, quality control, quality improvement. The quality theory put forward by Juran is basically a quality theory used in the business world to achieve profits, but it is a theory This can be adopted in educational institutions to achieve a goal, namely creating quality education.

RESEARCH METHODS

This method uses descriptive qualitative methods

RESULTS AND DISCUSSION

The meaning of the word quality in the Big Indonesian Dictionary is a measure of the good and bad of an object, situation, level or degree (smartness, intelligence, and so on). While Juran defines quality as, "Quality means those features of products which meet customer needs and thereby provide customer satisfaction. In this sense, the meaning of quality is oriented to income. The purpose of such higher quality is to provide greater customer satisfaction and, one hopes, to increase income."

Quality is a product feature that can meet customer needs and provide customer satisfaction. In this case the meaning of quality is income-oriented. The highest goal of quality is to provide greater customer satisfaction and increase higher revenues. In the world of education, there are two types of customer terms, namely internal customers and external customers.

Education is said to be quality if internal customers, including school principals, teachers and employees, can develop well, physically and psychologically. Physically, among other things, you get financial rewards. Meanwhile, psychologically, it would be like if they were given the opportunity to continue learning to develop their abilities, talents and creativity. Furthermore, regarding external customers which include: a) primary external, namely students, that education will be said to be quality if students are able to become lifelong learners, good communicators, have skills in everyday life, high integrity, problem solvers and knowledge creators. and become responsible citizens. b) secondary external, namely parents, government and companies, that graduates are able to meet the expectations of parents, government and companies in carrying out the tasks given to them. And the third is c) tertiary external, namely the job market and wider society, that education will be quality if graduates have competence in the world of work and community development, thereby influencing economic growth, people's welfare and social justice.

Thus, education customers are an important component to pay attention to and become a consideration in making decisions to achieve quality education. Starting from both internal and external customers. Excellent service must be provided in a balanced manner for educational customers, so that they truly feel satisfaction from the

educational services provided.

Juran defines quality as fitness for use, this means that a product or service should be in accordance with what is needed or expected by the user. Jurán further introduced three quality development processes or what is commonly known as the Jurán trilogy. Managing for quality makes extensive use of three such managerial processes: 1. Quality planning 2. Quality control 3. Quality improvement.

According to Jurán, the process of achieving quality/quality includes three stages, including quality planning, quality control and quality improvement.

Quality Planning/Quality Planning Quality planning is a structured process for developing products (goods and services) that can ensure customer needs are met. Quality planning tools and methods are combined together with technology tools for the specific product being developed and delivered. Quality planning is the first step in the process of achieving educational quality. Careful and careful planning is very necessary so that improving and controlling the quality of education can be carried out well. So that the quality of education which is the goal of the education management process can be achieved. Jurán also mentioned that there are several stages in quality planning steps, including: Establish the Project A quality planning project is the organized work required to prepare an organization to deliver a new or revised product, following the steps associated with quality planning. In managing educational institutions, stakeholders must be able to develop a program to improve the quality of education. This activity program is a strategy that is formulated and then implemented as a step in achieving quality education. So preparing various activity programs to improve the quality of education is a very important first step in managing educational institutions to achieve educational quality or goals. The preparation of activity programs to improve the quality of education must depart from strategic issues that exist in the educational institution environment, both internal and external. In this way, careful and appropriate strategies will be obtained in efforts to improve the quality of education. Identify the Customers Customers consist of a whole cast of characters that need to be fully understood. In general there are two groups of customers, including first, internal customers, namely those who are within the producer organization and secondly external customers, namely those who are outside the producer organization. In educational institutions there are also two educational customers, namely internal customers and external customers. Internal customers, namely school principals, stakeholders, teachers and employees. Meanwhile, external customers include primary, secondary and tertiary external customers. Primary externals include students, secondary externals include parents, government and companies, and tertiary externals include the world of work and the wider community. Discover the Customers Needs The third step of quality planning is to determine the needs of internal and external customers for the product. This step can be done by identifying/analyzing the internal and external environment to find strategic issues as ingredients in preparing an activity program to meet customer needs. In educational institutions, environmental analysis can be carried out using SWOT analysis, namely by identifying the internal strengths and weaknesses of the institution, and identifying external challenges and opportunities being faced by the institution. Develop the Product/Develop Products/Services In product development, product design is a creative process that is largely based on technological or functional expertise. Product designers are traditionally engineers, systems analysts, operations managers, and many other professionals. In the quality arena, designers can include the experience, position, and expertise of anyone who can contribute to the design process. The output of product design is detailed designs, drawings, models, procedures, specifications, and so on. The overall quality objective for this step is twofold: first, determine which product features and goals will provide optimal benefits to customers. Second, identify what is needed so that the design can be delivered without flaws. In the world of education, production is seen as a service. Services cannot be separated from the behavior or attitudes of the people who provide or provide services for customers, for example friendliness, politeness, calmness, accuracy, flexibility, stability, rationality, and so on. This is because service quality cannot be separated from the characteristics of

service quality which are determined from the relationship between customers and service providers. Errors in providing services can be identified immediately by knowing who provides the service. Meanwhile, for organizations or manufacturing companies, the error is only visible in the product, not the people in it. So that service development can be done by providing good and excellent service to educational customers. So that education customers can feel the satisfaction provided by service providers. Develop the Process Once a product is developed, it is necessary to determine how the product will be manufactured and delivered sustainably. The development process is a series of activities to determine the specific means that operations personnel will use to meet product quality goals. In the world of education, managers must always make improvements and upgrades continuously to ensure the achievement of established quality standards/continuous quality improvement. In this concept, educational institutions always update processes based on customer needs. Quality Control This quality control process consists of several steps, including: Select Control Subjects The first step taken in the quality control process is selecting the control subject. The subject of control comes from a variety of sources that include customer requirements appropriate to product features, technological analysis to translate customer requirements into product and process features, process features that directly affect product features, industry and government standards, need to protect human safety and the environment, and need to avoid side effects such as irritation to employees or offense to neighboring communities. In educational institutions, the subject of control comes from educational customers, and through educational quality standards, both internal and external quality standards. Internal quality standards are quality standards set by each educational institution, while external quality standards are quality standards set by government agencies. Determining Measurement/Establish Measurement After selecting the control subject, the next step is to determine the means to measure the quality of performance of goods or services. Measurement is one of the most difficult tasks in quality management. In defining measurements we need to clearly define the measurement tools, the frequency of measurements, the way the data will be recorded, the format for reporting the data, the analysis that will be performed on the data to convert the data. for usable information, and who will make the measurements. The use of measurement/evaluation data is very important in determining the education quality management process. The measurement results are feedback information for school principals or stakeholders regarding the real conditions of the quality process in educational institutions. In fact, the evaluation results must be the basis for making decisions for school principals or stakeholders. The quality of education can be measured by the satisfaction of educational customers and conformity with established quality standards, both internal and external quality standards. Developing Work Standards/Establish Standards of Performance Performance standards are achievements directed towards which effort is expended providing several examples of control subjects and related objectives. The main goal of a product or service is to meet customer needs. In the management of educational institutions, work standards are more often referred to as standard operating procedures/SOPs, which are documents relating to procedures for completing a job. SOPs are prepared to obtain the most effective work results. Measuring Actual Performance Measuring the actual performance of a product or process is an important step in quality control. To make these measurements requires a sensor, which is a tool to make the actual measurement. Sensors are special detection tools. It is designed to recognize the existence and intensity of certain phenomena, and to convert the resulting data into "information." This information then becomes the basis for decision making. At lower organizational levels, information is often real-time and used for current control. At a higher level, information is summarized in a variety of ways to provide broader measures, detect trends, and identify some important issues. Even in educational institutions, it is necessary to have tools to measure the extent of the quality that has been achieved. This needs to be done to get results that are truly considered accurate for measuring the quality of education. Accurate tools will also get accurate results, so you will know what the next steps are in efforts to improve and create quality

education. Interpreting the Differences between Standards and Real Data that Occur/Measure Actual Vs. Standard The act of comparing standards is often seen as the role of an umpire. The referee may be a human or a technological device. Referees may be asked to perform any or all of the activities. Referees in the management of educational institutions can be school principals, supervisors, or assessors, namely those who will be tasked with seeing and monitoring whether the quality improvement process that has been carried out is truly in accordance with the standards that have been set. This check can be done by: first, comparing actual quality performance with quality targets. Second, interpret the observed differences. Third, determine the actions that must be taken, and fourth, stimulate corrective action. • Make Decisions on Differences /Take Action on Differences School principals as managers in the process of improving quality in educational institutions, must be able to make decisions that are considered the wisest given the various existing differences. As a school principal, you are not allowed to have any inclination towards one party. The quality of education is not in the interest of one party, but is in the interest of all. Therefore, the quality of education must be built together through teamwork/solid cooperation, so that when there are differences they must be addressed wisely, because without good cooperation, the quality of education as the main goal of education will be difficult to achieve. Quality Improvement Improving the quality of education can be done in several steps, including: 1. Increased need to make improvements 2. Identify specific improvement programs 3. Organize programs 4. Organize to diagnose the cause of the error 5. Find the cause of the error 6. Make repairs 7. The improved process is in an effective operational condition 8. Provide controls to maintain improvements or improvements that have been achieved.

The concept of quality development according to Joseph M. Juran originates from quality development in the corporate world. But this concept can be adopted in developing quality in the world of education. As stated above, the quality of education in Indonesia is still said to be low, this is a whiplash for the Indonesian people, this does not mean being more pessimistic, but it is a deep thought for the government and education managers about how to improve the quality of education in Indonesia. Therefore, it cannot be denied that Indonesia still needs and emulates the concepts of thought from developed countries and the thoughts of figures who are experts in building the quality of education in Indonesia. One of them is the quality concept from Joseph M. Juran. It is hoped that with the contribution of the quality concept from several experts, in this case Joseph M. Juran's quality development concept, can transform it into better and higher quality education.

CONCLUSION

Quality is the existence of a product or service that can meet customer needs which can then provide customer satisfaction. Juran introduces three quality development processes or what is commonly known as the Juran Trilogy, namely: 1. Quality planning (Quality Planning) 2. Quality control (Quality Control) 3. Quality improvement (Quality Improvement)

Quality Planning	Quality Control	Quality improvement
- Define projects - Identify customers. - Discover customer needs. - Develop products. - Develop processes.	- Select the basis of control. - Determine measurements. - Develop work standards. - Measure actual performance. - Interpret the differences	- Increased need to make improvements. - Identify special improvement projects. - Organize projects. - Organize to

	between standards with data actually happened	diagnose the cause of the error. • Find the cause of the error. • Make improvements. • The improved process is in an effective operational condition. • Provide controls to maintain improvements has been achieved.
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Quality Revolution in Japan: Role of Dr. Joseph M. Juran

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Abstract

Post World War II, Japan was almost ruined. There was no worth mentioning production activities as such and quality was deplorable. The former Japanese military and the political leaders were no longer into power. The new generation of Japanese industrialists realised the need for quality improvement and an image change of Japanese products. The new breed of Japanese wanted Japan to develop as an industrialised nation unlike many Asian countries choosing agro-based economy. This change in mindset was instrumental towards Japan's economic turnaround. However, Japan's journey on this path was not easy. The paper focuses on the role of Dr. Joseph M. Juran, quality management expert, in revolutionising quality in the Japanese industry and giving it a rebirth.

Keywords: Total Quality Management, Companywide Quality Control, Big Q, Little Q

1. Introduction

In today's world we often talk about China's growth story and influence on the global economy. We are also of the opinion that although Chinese products are giving tough competition globally, yet, they are qualitatively poor. This was the situation of Japan before the World War II. Japanese products were sold at very low prices but they faced a problem of securing repeat sales as the products were very poor. Post World War II, Japan was almost ruined. There was no worth mentioning production activities as such and quality was deplorable. The former Japanese military and the political leaders were no longer into power. The new generation of Japanese industrialists realised the need for quality improvement and an image change of Japanese products. The new breed of Japanese wanted Japan to develop as an industrialised nation unlike many Asian countries choosing agro-based economy. This change in mindset was instrumental towards Japan's economic turnaround. However, Japan's journey on this path was not easy. Japan was in a vicious cycle of poor industrial development. Japan's poor product quality was the principal obstacle. No one wanted to repeatedly buy such low quality goods. In order to bring about an upward spiral in economic development there was a

need to buy good quality raw material from abroad, which in turn required foreign exchange. Japans' inability to export in turn led to inability to earn foreign exchange. People were not trained to build quality. The country was without guidance thus, a revolution in product quality became essential for Japanese industries (Juran, 1981).

Japan witnessed this quality revolution since the early 1950s. It took Japan nearly 30 years of hardship, with a very strong commitment to quality to become the third industrial power in the present world. The qualitative improvement was the result of efforts to apply the concept and techniques of statistical quality control on a companywide scale.

2. Objectives of the study

The paper focuses on the role of Dr. Joseph M. Juran, quality management expert, in revolutionising quality in the Japanese industry. In order to understand the quality improvements measures advocated by Dr. Juran the paper tries to touch upon some of the relevant areas namely; the Japanese cultural environment and the role of Japanese Union of Scientists and Engineers (JUSE).

3. Research Methodology

The study is essentially theoretical in nature. The materials for this study have been obtained from relevant books, journals, magazines and published work of various research scholars in the field of quality management.

4. Japanese Cultural Environment

It may be said that the Japanese cultural environment has had a very positive influence to the adoption and development of modern quality control. The main features of the Japanese culture towards revolutionising quality are mentioned as under:

- Japanese people are highly adaptable to the foreign culture.
- The density of population in Japan is virtually the highest in the world, and the competition among companies in both domestic and international markets is intense.
- Japanese society is rather homogeneous, with the same race and language. The mobility of Japanese workers among companies is relatively low as compared to the United States. This led to the Japanese companies being very enthusiastic about the education and training of its employees.
- According to Cole and Walder (1981), Japanese industries faced a very tight labour market in the late 1960s and early 1970s. The rising educational levels in

Japan led to an increasing proportion of new labour force entrants who were unwilling to accept the least demanding jobs. Instead, the workers wanted jobs that would allow them to develop their abilities and talents. The introduction of modern quality control and the creation of participative work structures appeared to management to be one reasonable strategy.

- According to Juran (1978), the kind of professionalism observed in the western countries was not observed in Japan. Japanese companies needed to promote ‘companywide quality control’, in which all employees participate, rather than providing a large, central quality department with numerous centralised functions of quality planning, coordination, and auditing.

5. JUSE

JUSE was founded in the year 1946. Its activities became focused on collecting and investigating information relating to modern quality control (QC) activities. The Quality Control (QC) Research Group was formed within JUSE in the year 1949 comprising of people from industry, academic institutions and government. With the aim of reporting the QC Research Group’s findings back to industry, in the same year, the basic QC course for six months was inaugurated. The mood of the Japanese industries towards QC adoption was phenomenal. This led to improving quality, driving down costs, raising productivity, and shortening the lead time by reducing the defects and rework. In this way, QC made a major contribution to recovery and reconstruction of Japanese industry, which had been virtually annihilated in the World War II.

6. Juran: A Brief History

Joseph M. Juran was born in the year 1904 in, Braila, Romania. He emigrated to the United States in the year 1912 and became an U.S. citizen in the year 1917. Juran’s major contribution has been in the field of management, particularly quality management. Juran has been called the ‘father’ of quality and a quality ‘guru’. He is recognised as the person who added the human dimension to quality i.e., broadening it from its statistical origins to what we now call total quality management (TQM). Juran extended the definition of quality from ‘conformance to specification’ to ‘fitness for use’. He also considered two aspects of product quality namely; ‘freedom from deficiencies’ and the other ‘product features’. Earlier quality improvement was primarily focused on reducing deficiencies but over time has developed to include even

adding product features that meet the needs of the customers in a wider way. This has become more and more important. Juran introduced the concept of 'Big Q' to distinguish it from the concept of 'Little Q'. According to Juran, 'Big Q' not only included product quality ('Little Q') but also quality of services such as accounting, invoicing, communication and so on. The concept of 'Big Q' contributed enormously to the concept of TQM.

The *Quality Control Handbook* was first published in 1951 by Dr. Juran. Till now there have been four editions of the book and Juran has been the editor-in chief. The handbook has contributions from quality experts and is considered to be very useful for quality practitioners across the world. It not only provides important reference on quality improvements but also acts as a source of inspiration to many.

7. Role of Juran in Revolutionising Quality on Japan

As a result of the publication of his *Quality Control Handbook*, JUSE invited Juran to hold quality control (QC) courses for top and middle level managers of Japanese companies beginning in 1954. More than 400 Japanese companies attended these lectures, with many of the participants belonging to the ranks of corporate chairman and senior executives of their most important industrial companies. These course materials became the basis of a management seminar series that was offered to several decades of Japanese managers. These courses had an immeasurably large impact on Japanese QC. It clearly positioned QC as a management tool and extended the QC philosophy which was previously restricted to narrow fields of production and inspection to almost every area of organisation activities.

Juran and Companywide Quality Control (CWQC)

It was Juran who advised the JUSE to use the term 'companywide quality control' (CWQC) in order to distinguish this activity from total quality control, or TQC as proposed by Freigenbaum. CWQC is characterised by the following three features:

- Participation of all the departments of the organisation.
- Participation of employees at all levels and departments (from top management to line workers and salesmen).
- Integrated process control (including quality, profits, quantity, safety and social worth).

Quality Assurance, which means quality control in a new product development, is the central concept of CWQC. It is intended to control the different aspects of quality.

CWQC is intended to govern work including those which falls outside the task of quality control. It may be mentioned that QC is a part of CWQC. JUSE initiated the Middle-Management QC Course in 1955 and the Special course for Executives in 1957. It may be mentioned here that these courses have been improved over time and are still held today.

The concept of CWQC had tremendous impact on the Japanese companies. The Deming Application Prize in the years 1961 and 1962 went to two companies namely; *Teijin* (a synthetic fiber manufacturer) and *Sumitomo Electric Industries*, respectively. At these two companies, QC activities were broadly defined to include suppliers' activities as well as other company activities such as market research, design, purchasing, production, inspection, sales and administration. The top management internal assessment in the form of 'hoshin kari' (policy management) is one of the most important CWQC activities. The revolutionary results obtained by CWQC campaigns conducted by these companies and the success posted by these two companies stimulated QC campaigns being conducted by many other Japanese enterprises. Although CWQC in Japan began in the manufacturing industries, in 1975 it spread its wings to the non-manufacturing industries such as hotels, banking, insurance transportation, electrical power, etc. It is worth mentioning that the concept of CWQC advocated by Juran was adopted by many American, Indian and Thai companies and they have won the Deming Application Prize to broaden their definition of QC activities and extend their QC activities to every link in the production chain.

The First International Conference on Quality Control (ICQC) was held in 1969 in Tokyo. At this conference Juran appreciated ICQC for their vision and courage in organising the historic seminar. He congratulated the Japanese for demonstrating to the world that determination and hard work can lead to tremendous qualitative improvements, even after the ravages of war, within the life span of a single generation. In 1981, Juran emphasised that the important features of CWQC activities that led to the transformation of Japanese industries from poor to the best are a massive, quality related education and training programs, annual programs of quality improvement and upper management leadership of the quality function.

8. Conclusion

Juran has been one of the greatest quality thinkers. He believed that qualitative improvements in the organisation were an outcome of the management's leadership

role in propagating quality within an organisation. In the year 2001, the board of directors of the American Society for Quality (ASQ) approved a senior medal named in his honour, The ASQ Juran Medal in recognition of his long-term contribution to quality and the importance of this idea (Watson, 2005). Juran has been instrumental in scripting the quality revolution in Japan. Moreover, in recognition to his development of quality control in Japan as well as facilitating U.S. and Japan friendship, Dr. Juran was presented with 'The Order of the Sacred Treasure (2nd class)' in 1981 by the late Japanese Emperor, Hirohito. The Japanese zeal for learning and for self-sufficiency brought out a follow-up of numerous courses, by local experts, for engineers and managers at all levels. These were the outcome of Deming's lectures in statistical methodology and Juran's courses on management of quality control. It is rightly said that if Deming is considered to be 'The American Who Taught the Japanese About Quality', Juran is credited as 'The Creator of Modern Quality Management'.

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HEROES AND MARTYRS OF QUALITY AND SAFETY

Joseph Juran: overcoming resistance to organisational change

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Dr Joseph Juran is well known to most quality scholars. With a productive career spanning over three quarters of a century, his leadership and service in the field of quality management is measured in decades, not years. He has taught or consulted in at least 34 countries. He has written or contributed to hundreds of papers, speeches and dozens of books. His books have been translated into 12 or more languages. Among other things, he has pushed the concepts of the Pareto principle and Juran trilogy, and has increased the role of the human dimension in quality.¹

Juran currently lives with his wife in Rye, New York, USA. He was born in Braila, Romania on 24 December 1904. His father was a shoemaker. At the age of 8 years, he and his family moved to Minneapolis, USA. The relocation was motivated by a desire to escape poverty and anti-Semitism. His mother died from tuberculosis about 8 years later. As a child and young adult, Juran was no stranger to hard work, and he reported that he had about 16 jobs, including selling newspapers, being a grocery store clerk, book-keeping and being a janitor, in the 12 years that he lived in Minneapolis. He learnt from all his work experiences, but he also pursued a formal education in addition to his demanding work schedule.^{1,2} In 1924, he obtained a degree in electrical engineering from the University of Minnesota. He married Sadie Shapiro in 1926. He later went on to obtain a law degree from Loyola University in 1936, perhaps motivated by the economic uncertainty of the Depression.

With a starting salary of \$27/week, Joseph Juran worked at the Western Electric Hawthorne plant in Cicero, Illinois, USA, from 1924 to 1941. There, he was influenced by Walter A Shewhart. Juran, Walter A Shewhart³ and W Edwards Deming⁴ are considered to be the three key founders of the quality improvement movement. From 1924 to 1933, the Hawthorne plant was a remarkable place for its unique role in advancing the science of quality improvement, and for the studies by Elton Mayo on worker productivity.

Juran's career went from one highpoint to the next. During World War II, from 1941 to 1945 he was assistant administrator at the Lend Lease Administration for the US government. He taught industrial engineering as a professor and was department chairman at New York University from 1945 to 1951. In 1979 Juran created the Juran Institute, and in 1983 the Juran Foundation. Juran was active in creating, and is active in supporting the Malcolm Baldrige National Quality Award, both directly as an individual and through the Juran Foundation. In 1997, the Juran Foundation was renamed the Juran Center for Leadership in Quality after being transferred to the University of Minnesota, Carlson School of Management.

Juran's first publication was in 1923. It was a newspaper article on the game of chess. He is passionate about writing and went on to publish hundreds of articles and papers, and more than 30 books. Three of his books that have had an

international impact are *Juran's quality handbook*, *Managerial breakthrough* and *Juran on quality by design*.^{6–8}

Juran contributed greatly to the human dimension of management. Other contributions that will be recognisable to most quality scholars include the Pareto Chart and the Juran Trilogy.

PARETO CHART

The Pareto Chart is named after the 19th century Italian economist, Vilfredo Pareto. Pareto stated that 80% of the wealth of the country was held by approximately 20% of the population.

In 1937, Joseph Juran stated that this principle also applied to defects, so that 80% of the problems are caused by 20% of the defects, which meant that if you focused on that 20%, you could have a big effect with minimal effort. Juran called this the Pareto Principle.

The Pareto Chart is basically a bar chart in which the bars are sorted so that the highest bar (highest count of defects) is on the left, the second highest bar is next, and so on, with the shortest bar on the far right. The chart is used to prioritise problems or processes that require an input of resources to improve. It separates the "vital few" from the "useful many". Figure 1 shows an example of a Pareto analysis from a 23-item survey on patient satisfaction. Six items were found to be non-contributing factors; therefore, only 17 items are displayed in the Pareto diagram.⁹

Pareto charts often include a cumulative percentage line, which starts with the highest bar on the left and peaks to the right to show the cumulative percentage of all causes.

Juran takes on Al Capone's gang and wins

Half a block away from the Hawthorne plant in Cicero, Illinois, on 22nd Street was the headquarters of Al Capone's gang. Capone was the most famous of America's prohibition gangsters. He helped give Chicago the tough reputation it holds to this day. Juran remembered reports of rival gang members driving down 22nd Street passing the Hawthorne buildings with guns blazing as they battled for criminal supremacy. At Capone's nearby gambling establishment, "The Shop", Juran observed that one of Capone's workers was so inept and so repetitive in running the roulette wheel that Juran collected and analysed data about this dealer's behaviour and was able to win \$100 as a result. In those days \$100 was equal to several weeks of Juran's pay.⁵

One supposes that the roulette wheel was rigged so that Juran could figure out a predictable non-random pattern of results. One also supposes that Juran was wise enough not to win too much, to avoid the close attention of Capone's thugs.

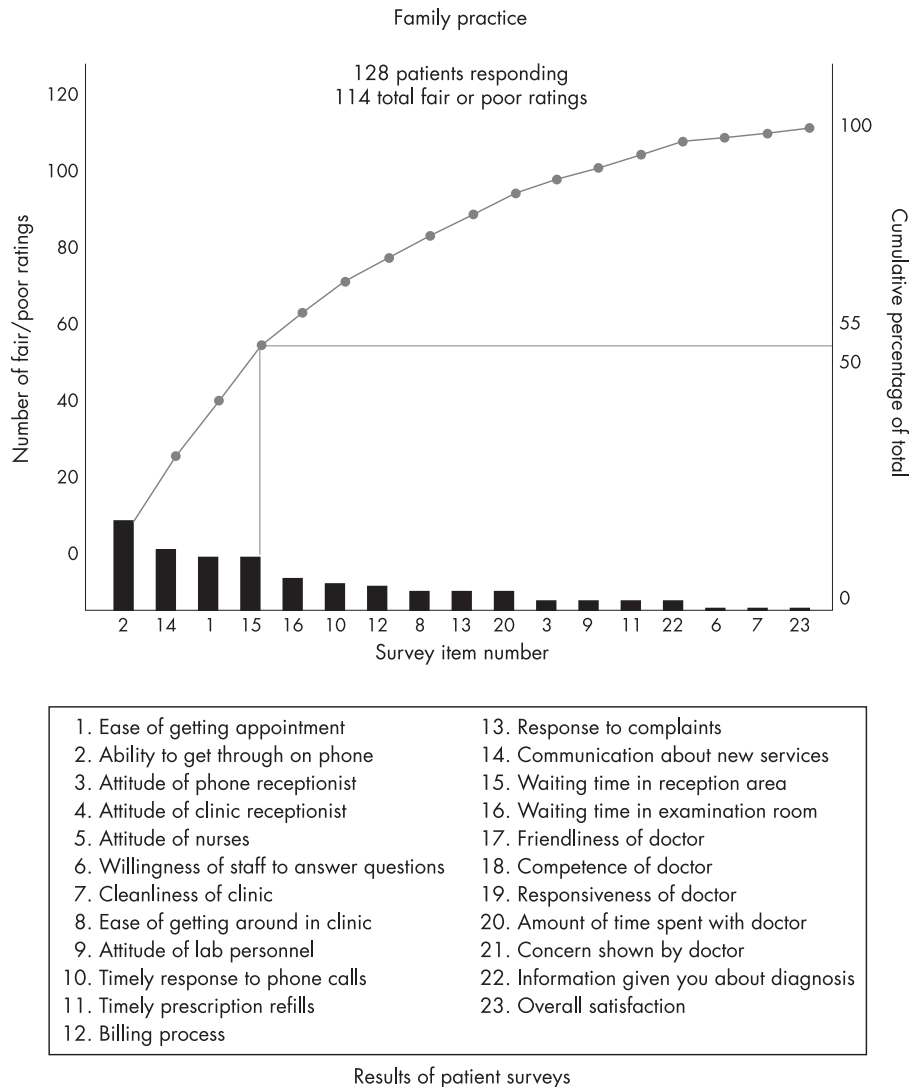


Figure 1 An example of Pareto analysis (reprinted with kind permission from Juran Institute, Inc).

JURAN'S QUALITY TRILOGY

Quality improvement professionals communicate most effectively with managers when they use the language of management and finance. In this regard, the Juran Quality Trilogy provides a frame for linking finance and management to quality improvement.

The three trilogy components¹⁰ are

- Quality planning—define customers and how to meet their needs.
- Quality control—keep the process working well.
- Quality improvement—learn, optimise, refine and adapt.

Juran has been awarded four honorary doctorates and numerous honorary memberships and awards, including the Order of Sacred Treasure from Japan. Juran taught his managing for quality courses in 40 countries, with a total of over 100 000 people in attendance.¹¹ Don Berwick has said “Within the quality field, Dr Juran’s depth of work is remarkable. He didn’t just combine the science of quality with its practical aspects; he welded them together. His work is deeply scientific and deeply pragmatic, which is unique.”¹¹ The pragmatic aspect of Dr Juran’s work is his ability to implement and manage changes that lead to improved quality.

IMPLEMENTATION

Whatever advances American manufacturing has made in the last thirty to forty years, we owe to Joe Juran and to his untiring, steady, patient, self-effacing work.¹³ (Drucker)

The human dimension that leads to organisational inertia is a major obstacle for quality improvement. Juran gained a remarkable insight when he read Mead’s *Cultural patterns and technical change*¹⁴ in 1956. It appears to have opened his thinking to new strategies for addressing the organisational inertia that may reside in organisational culture. He then saw this common barrier to change as cultural resistance. This insight into the root cause of organisational resistance proved valuable in implementing changes leading to quality improvement. Change takes place in the context of the culture. The change has to be tailored to the values, norms and customs of the organisation. In healthcare today, we integrate the art of applying the knowledge of cultural anthropology and psychology with human factors science and biostatistics to improve quality and patient safety. Juran stated in his memoirs: “To those whose careers are in the field of managing for quality, thank your lucky stars. Your field will grow extensively during your lifetime, especially in

Customer-mindedness, statistical-mindedness and organisational transformation

- Customer-mindedness (who do we serve?) requires quality planning.
- Statistical-mindedness (how do we know that we are meeting the needs of the people we serve?) uses quality control.
- Organisational transformation (how do we change to better meet these needs?) requires quality improvement.

These three concepts, customer-mindedness, statistical-mindedness and organisational transformation, have been organising principles of this "Heroes and Martyrs" series. These three concepts have much in common with the Juran Trilogy.

Juran, the historian of quality management

Juran edited and coauthored *A history of managing for quality* (1995). There are chapters on the early history of managing for quality from ancient China, Israel, Greece, India, Rome, Scandinavia and from modern Japan, England and the USA. Other chapters include the Venetian Arsenal, French cathedrals and arms, Czech beer making and mining, and making accurate clocks.

This 688-page tome has many historic photographs that will be of interest to quality scholars. One photograph is of an Egyptian stonecutter and an inspector with a measuring string checking on the cutter's work for quality. This picture dates from 3500 years ago and became part of the symbol of the Juran Institute.¹² There is another picture of a 2000-year-old stone carving from China, which shows the two mythical ancestors of humanity: Fuxi and Nuioa. They have human torsos and eel-like tails (perhaps the ancient Chinese believed in evolution). Fuxi holds a carpenter's square used to measure a right angle accurately. The myth is that Fuxi invented the yardstick (Juran,¹² p7).

three of our giant industries—health, education and government. There will be exciting opportunities for innovation and service to society."²

In the simplest of terms, Juran defines quality as "fitness for use". Overcoming cultural resistance in organisations is key to making quality management philosophy and principles fit for use by allowing implementation and practice. As of this writing, Joseph Juran is over 100 years old and has lived long enough to see his ideas accepted.

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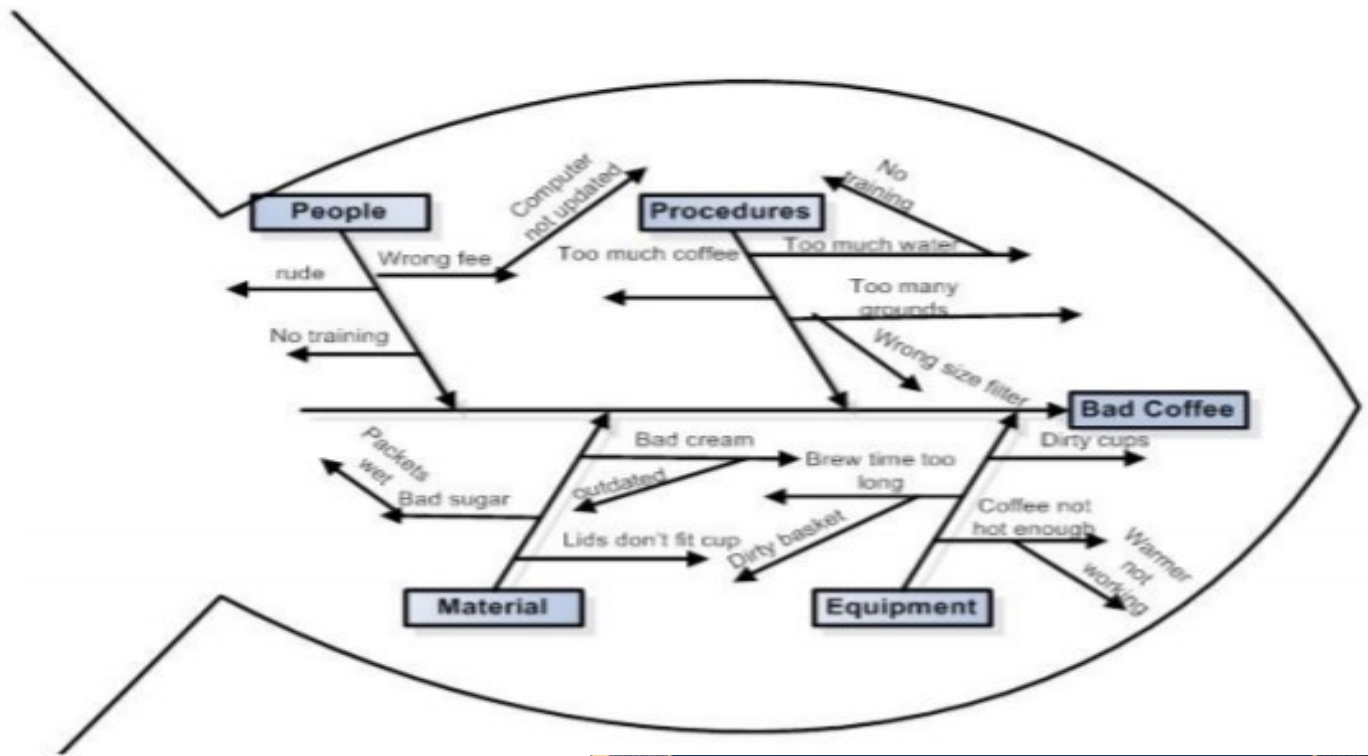
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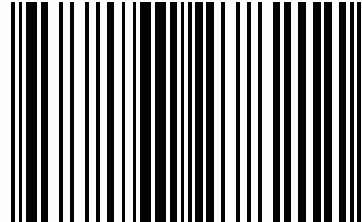
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THE JURAN PHILOSOPHY





DR. JOSEPH JURAN

Joseph Moses Juran was a Romanian-American engineer and management consultant. He was an evangelist for quality and quality management, having written several books on these subjects. He was the brother of Academy Award winner Nathan Juran.

- ◆ has been called the father of quality
- ◆ a quality guru, and
- ◆ the man who taught quality to the Japanese.
- ◆ One of his stellar contributions is the Juran trilogy of the three quality processes: quality control, quality planning, and quality improvement.

QUALITY TRILOGY




- **QUALITY PLANNING:** process of preparing to meet quality goals. Involves understanding customer needs and developing product features.
- **QUALITY CONTROL:** process of meeting quality goals during operations. Control parameters. Measuring the deviation and acting.
- **QUALITY IMPROVEMENT:** process for breaking through to unprecedented levels of performance. Identify areas of improvement and get the right people to bring about the change.

TEN STEPS TO QUALITY


 Established awareness for the need to improve & the opportunities for improvement.


 Set goals for improvement.


 Organize to meet the goals that have been set.


 Provide training.


 Implement projects aimed at solving problems.


 Report progress.


 Give recognition.


 Communication results.


 Keep score.


 Maintain momentum by building improvement into company's regular systems.